ATTACHMENT A

USEPA CONTRACT LABORATORY PROGRAM

STATEMENT OF WORK

FOR

INORGANICS ANALYSIS

Multi-Media

Multi-Concentration

Document Number ILM04.0

STATEMENT OF WORK
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EXHIBIT A

SUMMARY OF REQUIREMENTS

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CONTRACTOR OPERATED:

SAMPLE MANAGEMENT OFFICE

The Sample Management Office (SMO) is operated the Contract Laboratory Analytical Services Support (CLASS) contract awarded and administered by the U.S. Environmental Protection Agency (EPA). Laboratory contractors are advised that wherever in this document the words "Sample Management Office", "SMO", "Contract Laboratory Analytical Services Support" or "CLASS" appear, EPA is referring to those contractor employees. The contract is currently held by DynCorp●Viar under Contract No. 68-D4-0104. Laboratory contractors are also advised that DynCorp●Viar employees are not representatives or agents of EPA. As such, DynCorp●Viar nor its employees, nor any successor contractor, may change, waive, or interpret any terms and conditions in this contract, including this document (ILM04.0). All such questions or inquiries should be addressed to the responsible party within EPA.

QUALITY ASSURANCE TECHNICAL SUPPORT LABORATORY

The Quality Assurance Technical Support (QATS) Laboratory contract was awarded and is administered by the U.S. Environmental Protection Agency (EPA). Laboratory contractors are advised that wherever in this document the "Quality Assurance Technical Support Laboratory" or "QATS" appear, EPA is referring to those employees. The contract is currently held by ICF Kaiser Engineers, Inc. (ICF), under Contract No. 68-D5-0002. Laboratory contractors are also advised that ICF employees are not representatives or agents of EPA. As such, ICF nor its employees, nor any successor contractor, may change, waive, or interpret any terms and conditions in this contract, including this document (ILM04.0). All such questions or inquiries should be addressed to the responsible party within EPA.

SECTION I
GENERAL REQUIREMENTS

The Contractor shall employ procedures specified in this Statement of Work (SOW) in the preparation and analysis of aqueous (water) and solid (soil/sediment) samples for the presence and quantitation of 23 indicated elements and cyanide.

The Contractor shall use proven instruments and techniques to identify and measure the elements and inorganic species presented in the Target Analyte List (Exhibit C). The Contractor shall perform sample preparation and analysis procedures as prescribed in Exhibit D, meeting specified sample preservation and holding time requirements.

If dissolved metals are requested by the EPA Regional offices, the Contractor shall follow the instructions provided on the Traffic Report(s). If there are no instructions on the Traffic Report, the Contractor shall digest the samples designated as dissolved metals.

If the Regional office indicates on the Traffic Report that a digestion is not to be performed when analyzing field samples for dissolved metals, then an aqueous laboratory control sample (LCS) and a post-digestion (hardcopy Form 5B and diskette QC codes PDO and PDF) spike sample are not required.

The Contractor shall adhere to the quality assurance/quality control protocol specified in Exhibit E for all samples analyzed under this contract.

Following sample analysis, the Contractor shall perform data reduction and shall report analytical activities, sample data, and quality control documentation as designated in Exhibit B.

Exhibit F contains chain-of-custody and document control requirements which the Contractor must follow in processing samples and specifies requirements for written laboratory standard operating procedures.

To ensure proper understanding of language utilized in this contract, Exhibit G contains a glossary of terms. When a term is used in the text without explanation, the glossary meaning shall be applicable. Glossary definitions do not replace or take precedence over specific information included in the SOW text.

Exhibit H contains the Agency Standard implementation for reporting data electronically.

The samples to be analyzed by the Contractor are from known or suspected hazardous waste sites and, potentially, may contain hazardous inorganic and/or organic materials at high concentration levels. The Contractor should be aware of the potential hazards associated with the handling and analyses of these samples. It is the Contractor's responsibility to take all necessary measures to ensure the health and safety of its employees.

In addition, the Contractor must be aware of the importance of maintaining the integrity of the data generated under the contract since the data are used to make major decisions regarding public health and environmental welfare. The data may also be used in litigation against Potentially Responsible Parties in

the enforcement of Superfund legislation.

Prior to accepting any samples from the Agency, the Contractor shall have, in house, the appropriate analytical and quality assurance standards for all target analytes listed in Exhibit C.

SECTION II
SPECIFIC REQUIREMENTS

A. FOR EACH SAMPLE, THE CONTRACTOR SHALL PERFORM THE FOLLOWING TASKS:

Task I: Receive and Prepare Hazardous Waste Samples.

1. Chain-of-Custody. The Contractor shall receive and maintain samples under proper chain-of-custody and sample documentation procedures described in Exhibit F. A sample consists of all components, perhaps more than one phase, contained inside appropriate receptacles. More than one container may be used for a single sample; individual containers may contain preservatives for different analysis portions. Containers may be glass or plastic. All associated document control and inventory procedures shall be developed and followed. Documentation, as described therein, shall be required to show that all procedures are being strictly followed. This documentation shall be reported as the Complete Sample Delivery Group File (CSF) (See Exhibit B). The Contractor shall establish and use appropriate procedures to handle confidential information received from the Agency.

2. Sample Scheduling/Shipments. Sample shipments to the Contractor's facility will be scheduled and coordinated by the CLP Sample Management Office (SMO). The Contractor shall communicate with SMO personnel by telephone, as necessary throughout the process of sample scheduling, shipment, analysis and data reporting, to ensure that samples are properly processed.

   Samples will be routinely shipped directly to the Contractor through a delivery service. The Contractor shall be available to receive sample shipments at any time the delivery service is operating, including Saturdays and holidays. As necessary, the Contractor shall be responsible for any handling or processing for the receipt of sample shipments, including pick-up of samples at the nearest servicing airport, bus station or other carrier within the Contractor's geographical area.

   The Contractor shall accept all samples scheduled by SMO, provided that the total number of samples received in any calendar month does not exceed the monthly limitation expressed in the contract. Should the Contractor elect to accept additional samples, the Contractor shall remain bound by all contract requirements for analysis of those samples accepted.

   If insufficient sample volume (less than the required amount) is received to perform the analysis, the Contractor shall contact SMO to apprise them of the problem. SMO will contact the Region for instructions. The Region will either approve that no sample analysis be performed or will require that a reduced volume be used for the sample analysis. No other changes in the analysis will be permitted. SMO will notify the Contractor of the Region's decision. The Contractor shall document the Region's decision in the SDG narrative.

The Contractor shall be required to routinely return sample shipping containers (i.e., coolers) to the appropriate sampling office within fourteen (14) calendar days following shipment receipt (see Clause entitled Government Furnished Supplies and Materials).

If there are problems with the samples (e.g., mixed media, containers broken or leaking) or sample documentation/paperwork (e.g., Traffic Reports not with shipment, or sample and Traffic report do not correspond), the Contractor shall immediately notify SMO regarding any problems and/or laboratory conditions that affect the timeliness of analyses and data reporting. In particular, the Contractor shall immediately notify SMO personnel in advance regarding sample data that will be delivered late and shall specify the estimated delivery date.

3. The Contractor shall prepare and analyze samples within the maximum holding times specified in Section II of Exhibit D even if these times are less than the maximum data submission time allowed in this contract.

4. The Contractor is advised that the samples received under this contract are usually from known or suspected hazardous waste sites and may contain high (greater than 15%) levels of organic and inorganic materials of a potentially hazardous nature and of unknown structure and concentration, and should be handled throughout the analysis with appropriate caution. It is the Contractor's responsibility to take all necessary measures to ensure laboratory safety.

5. To more effectively monitor the temperature of the sample shipping cooler, each USEPA Regional office may include a sample shipping cooler temperature blank with each cooler shipped. The temperature blank will be clearly labeled: USEPA COOLER TEMPERATURE INDICATOR.

   When the USEPA Regional office supplies a cooler temperature indicator bottle in the sample shipping cooler, the Contractor shall use the USEPA supplied cooler temperature indicator bottle to determine the cooler temperature. The temperature of the cooler shall be measured at the time of sample receipt by the Contractor.

   The temperature of the sample shipping cooler shall be measured and recorded immediately upon opening the cooler, and prior to unpacking the samples or removing the packing material.

   To determine the temperature of the cooler, the Contractor shall locate the cooler temperature indicator bottle in the sample shipping cooler, remove the cap and insert a calibrated thermometer into the cooler temperature indicator bottle. Prior to recording the temperature, the Contractor shall allow a minimum of 3 minutes, but not greater than 5 minutes for the thermometer to equilibrate with the liquid in the bottle. At a minimum, the calibrated thermometer shall have a measurable range of 0 to 50 degrees Celsius.

If the temperature of the sample shipping cooler's temperature indicator exceeds 10 degrees Celsius, the Contractor shall contact the Sample Management Office (SMO) and inform them of the temperature deviation. The SMO will contact the Region from which the samples were shipped for instruction on how to proceed. The Region will either require that no sample analysis(es) be performed or that the Contractor proceed with the analysis(es). The SMO will in turn notify the Contractor of the Region's decision. The Contractor shall document the Region's decision in the SDG narrative. Also, in the SDG narrative, the Contractor shall list by fraction, the USEPA sample number, all samples which were shipped in a cooler which exceeded 10 degrees Celsius.

The Contractor shall record the temperature of the cooler on the DC-1 Form, under Remark #8 - Sample Conditions, and in the SDG narrative.

Task II: Analyze Samples for Identity and Quantitation of Specific Inorganic Constituents.

1. For each sample received, the Contractor may be required to perform the analyses described in the following paragraphs 2., 3. and 4. The documentation that accompanies the sample(s) to the Contractor facility shall indicate specific analytical requirements for that sample or set of samples.

   The Contractor shall provide the required analytical expertise and instrumentation for analysis of the Target Analyte List (TAL) elements and cyanide equal to or lower than the detection limits specified in Exhibit C. In exhibit D, EPA provides the Contractor with the specific sample preparation techniques for water and soil/sediment samples and the analytical procedures which must be used. A schematic flow chart depicting the complete low level-medium level inorganics analytical scheme is presented in Section I of Exhibit D.

2. Exhibit D specifies the analytical procedures that must be used. Exhibit D contains instructions and references for preparation of samples containing low-to-medium concentrations of inorganics for ICP analysis; flame, graphite furnace and cold vapor AA analysis and cyanide analysis. The identification and quantitation of analytes other than cyanide shall be accomplished using the ICP or AA methods specified in Exhibit D and shall achieve the Contract Required Detection Limit (CRDL) specified in Exhibit C. Cyanide shall be analyzed by the individual procedures specified in Exhibit D.

3. All samples shall initially be run undiluted (i.e., the final product of sample preparation procedure). When an analyte concentration exceeds the calibrated or linear range, appropriate dilution (but not below the CRDL) and reanalysis of the prepared sample is required, as specified in Exhibit D.

4. For the purpose of this contract, a full sample analysis is defined as the analysis for ALL of the target constituents identified in Exhibit C in accordance with the methods in Exhibit D and performance of related QA/QC as specified in Exhibit E. Duplicate sample, laboratory control sample, and spike sample analyses shall each be considered a separate full sample analysis. All other QA/QC requirements are considered an inherent part of this contract Statement of Work and are included in the contract sample unit price.

Task III: Perform Required Quality Assurance/Quality Control Procedures

1. All specific QA/QC procedures prescribed in Exhibit E shall be strictly adhered to by the Contractor. Records documenting the use of the protocol shall be maintained in accordance with the document control procedures prescribed in Exhibit F, and shall be reported in accordance with Exhibit B requirements.

2. The Contractor shall establish and use on a continuing basis QA/QC procedures including the daily or (as required) more frequent use of standard reference solutions from EPA, the National Institute of Standards and Technology or secondary standards traceable thereto, where available at appropriate concentrations (i.e., standard solutions designed to ensure that operating parameters of equipment and procedures, from sample receipt through identification and quantitation, produce reliable data). Exhibit E specifies the QA/QC procedures required.

3. The Contractor shall maintain a Quality Assurance Plan (QAP) as defined in Exhibit E with the objective of providing sound analytical chemical measurements. This program shall incorporate the quality control procedures, any necessary corrective action, and all documentation required during data collection as well as the quality assessment measures performed by management to ensure acceptable data production.

4. Additional quality assurance and quality control shall be conducted in the form of the analysis of laboratory performance evaluation samples submitted to the laboratory by the Agency. The results of all such quality control or laboratory evaluation samples may be used as the basis for an equitable adjustment to reflect the reduced value of the data to the Agency or rejection of the data for: sample(s) within an SDG, a fraction (e.g., metals and/or cyanide) within an SDG, and/or may be used as the basis for contract action. "Compliant performance" is defined as that which yields correct analyte identification and concentration values as determined by the Agency, as well as meeting the contract requirements for analysis (Exhibit D), quality assurance/quality control (Exhibit E), data reporting and other deliverables (Exhibits B and H), and sample custody, sample documentation and standard operating procedure documentation (Exhibit F).

5. Laboratory Control Sample (LCS) - This standard solution is designed to assure that the operating parameters of the analytical instrumentation and analytical procedures from sample preparation

through identification and quantitation produce reliable data. The Contractor must analyze the LCS concurrently with the analysis of the samples in the Sample Delivery Group (see Exhibit A, Part I).

B. EPA has provided to the Contractor formats for the reporting of data (Exhibits B and H). The Contractor shall be responsible for completing and returning analysis data sheets and submitting computer-readable data on diskette in the format specified in this SOW and within the time specified in the Contract Performance/Delivery Schedule (see Exhibit B).

1. Use of formats other than that designated by EPA will be deemed as noncompliant. Such data are unacceptable. Resubmission in the specified format at no additional cost to the government shall be required.

2. Computer generated forms may be submitted in the hardcopy data package(s) provided that the forms are in EXACT EPA FORMAT. This means that the order of data elements is the same as on each EPA required form, including form numbers and titles, page numbers, header information, columns and lines.

3. The data reported by the Contractor on the hardcopy data forms and the associated computer-readable data submitted by the Contractor on diskette shall contain identical information. If during government inspection discrepancies are found, the Contractor shall be required to resubmit either or both sets of data at no additional cost to the Government. The resubmitted diskette and/or hardcopy shall contain all of the initially correct information previously submitted for all samples including, but not limited to, the Laboratory Control Sample, standards, and blanks in the SDG in addition to the corrections replacing the variables which were incomplete or incorrect according to the requirements in the SOW.

C. The Contractor shall provide analytical equipment and technical expertise for this contract as specified by the following:

1. Inductively coupled plasma (ICP) emission spectrometer with the capability to analyze metals sequentially or simultaneously.

2. Atomic absorption (AA) spectrometer equipped with graphite furnace, flame, and cold vapor AA (or a specific mercury analyzer) analysis capabilities for the analysis of metals.

3. Analytical equipment/apparatus for analysis of cyanide as described in Exhibit D.

D. The Contractor shall designate and utilize qualified key personnel to perform the functions specified in this Statement of work. The EPA reserves the right to review personnel qualifications and experience.

E. The Contractor shall respond (within seven days) to written requests from data recipients for additional information or explanations that result from the Government's inspection activities unless otherwise specified in the contract (see Exhibit E for details on Government inspection activities).

F. The Contractor is required to retain unused sample volume and used sample containers for a period of 60 days after data submission. From time of receipt until analysis, the Contractor shall maintain soil/sediment samples at 4°C (±2°C).

G. Sample analyses will be scheduled by groups of samples, each defined as a Case and identified by a unique EPA Case number assigned by SMO. A Case signifies a group of samples collected at one site or geographical area over a finite time period, and will include one or more field samples with associated blanks. Samples may be shipped to the Contractor in a single shipment or multiple shipments over a period of time, depending on the size of the Case. A Case consists of one or more Sample Delivery Groups (SDG). An SDG is defined by the following, whichever is most frequent:

- each Case of field samples received, OR
- each 20 field samples within a Case, OR
- each 14 calendar day period during which field samples in a Case are received (seven calendar day period for 14-day data turnaround contracts), said period begins with the receipt of the first sample in the SDG.

Samples may be assigned to Sample Delivery Groups by matrix (i.e., all soils in one SDG, all waters in another), at the discretion of the laboratory. Such assignment shall be made at the time the samples are received, and may not be made retroactively.

Data for all samples in an SDG shall be submitted together (in one package) in the order specified in Exhibit B. The SDG number is the EPA sample number of the first sample received in the SDG. When several samples are received together in the first SDG shipment, the SDG number is the lowest sample number (considering both alpha and numeric designations) in the first group of samples received under the SDG. The SDG number is reported on all data reporting forms. The SDG Receipt Date is the day that the last sample in the SDG is received.

The Contractor is responsible for identifying each SDG as samples are received, through proper sample documentation (see Exhibit B) and communication with SMO personnel.

H. Each sample received by the Contractor will be labeled with an EPA sample number, and accompanied by a Traffic Report form bearing the sample number and descriptive information regarding the sample. EPA field sample numbers are six digits in length. If the Contractor receives a sample number of any other length, contact SMO immediately. The Contractor shall complete and sign the Traffic Report, recording the date of sample receipt and sample condition on receipt for each sample container. The Contractor shall also follow the instructions given on the Traffic Report in choosing the QC samples when such information is provided.

The Contractor shall submit signed copies of Traffic Reports for all samples in a Sample Delivery Group to SMO within FIVE (5) WORKING days following receipt of the last sample in the SDG. Traffic Reports shall

be submitted in SDG sets (i.e., all Traffic Reports for an SDG shall be clipped together) with an SDG Cover Sheet containing information regarding the Sample Delivery Group, as specified in Exhibit B.

I. EPA Case numbers (including SDG numbers) and EPA sample numbers shall be used by the Contractor in identifying samples received under this contract both verbally and in reports/correspondence.

SECTION III
TECHNICAL AND MANAGEMENT REQUIREMENTS

I. TECHNICAL AND MANAGEMENT CAPABILITY

Personnel - The Contractor shall have adequate personnel at all times during the performance of the contract to ensure that EPA receives data that meet the terms and conditions of the contract.

Instrumentation - The Contractor shall have sufficient inductively coupled plasma (ICP) emission spectrometers with the capability to analyze metals sequentially or simultaneously, atomic absorption (AA) spectrometers equipped with graphite furnace, flame, and cold vapor AA (or specific mercury analyzers) analysis capabilities for the analysis of metals,and analytical equipment/apparatus for analysis of cyanide as described in Exhibit D to meet all the terms and conditions of the contract.

Facilities - The Contractor shall maintain a facility suitable for the receipt, storage, analysis, and delivery of the product meeting the terms and conditions of the contract.

EXHIBIT B

REPORTING AND DELIVERABLES REQUIREMENTS

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SECTION I
CONTRACT REPORTS/DELIVERABLES DISTRIBUTION
(For 35-Day Turnaround Contracts)

The following table reiterates the Contract reporting and deliverables requirements specified in the Contract Schedule (Performance/Delivery Schedule) and specifies the distribution that is required for each deliverable.

NOTE: Specific recipient names and addresses are subject to change during the term of the contract. The Administrative Project Officer will notify the Contractor in writing of such changes when they occur.

TABLE 1

	Item	No. of Copies	Delivery Schedule	Distribution (1)	(2)	(3)
*A.	Standard Operating Procedures	1	60 days after contract award, and as required in Exhibit E.		As Directed	
B.	Sample Traffic Reports	1	5 working days after receipt of last sample in Sample Delivery Group (SDG).**	X		
C.	Sample Data Package++	1	35 days after VTSR** of last sample in SDG.	X		1
D.	Data in Computer Readable Format++	2	35 days after VTSR of last sample in SDG.	X	X	
E.	Results of Intercomparison Study/PE Sample Analysis Study++	2	35 days after VTSR of last sample in SDG	X		X
***F.	Complete SDG File++	1	35 days after VTSR of last sample in SDG.		X	
****G.	Quarterly/ Annual Verification of Instrument Parameters	2	Quarterly: 15th day of January, April, July, October. Annual: 15th day of January.	X	X	

	Item	No. of Copies	Delivery Schedule	Distribution (1)	(2)	(3)
*H.	Quality Assurance Plan	1	60 days after contract award, and as required in Exhibit E.		As Directed	

Distribution:
(1) Sample Management Office (SMO) - CLASS Contractor
(2) Region-Client
(3) Quality Assurance Technical Support (QATS) Contractor

Note: 1 Contractor-concurrent delivery to QATS may be required upon request by the APO. Retain for 365 days after data submission, and submit within 7 days after receipt of written request by the APO.

Footnotes:

++ DELIVERABLES ARE TO BE REPORTED TOTAL AND COMPLETE. Concurrent delivery is required. Delivery shall be made such that all designated recipients receive the item on the same calendar day. This includes resubmission of both the hardcopy and diskette. The date of delivery of the SDG, or any sample within the SDG, is the date all samples have been delivered. If the deliverables are due on a Saturday, Sunday or Federal holiday, then they shall be delivered on the next business day. Deliverables delivered after this time will be considered late.

* See Exhibit E for description. Time is cited in calendar days.

** VTSR (Validated Time of Sample Receipt) is the date of sample receipt at the Contractor's facility, as recorded on the shipper's delivery receipt and Sample Traffic Report. Sample Delivery Group (SDG) is a group of samples within a Case, received over a period of 14 days or less (seven days or less for 14-day data turnaround contracts) and not exceeding 20 samples. Data for all samples in the SDG are due concurrently. (See SOW Exhibit A, for further description).

*** Complete SDG file will contain the original sample data package plus all of the original documents described in Exhibit B of the Statement of Work under Complete SDG File.

**** Also required in each Sample Data Package.

NOTE: As specified in the Contract Schedule (Government Furnished Supplies and Materials), unless otherwise instructed by the CLP Sample Management Office, the Contractor shall dispose of unused sample volume and used sample bottles/containers no earlier than sixty (60) days following submission of reconciled analytical data.

SECTION I
CONTRACT REPORTS/DELIVERABLES DISTRIBUTION
(For 14-Day Turnaround Contracts)

The following table reiterates the Contract reporting and deliverables requirements specified in the Contract Schedule (Performance/Delivery Schedule) and specifies the distribution that is required for each deliverable.

NOTE: Specific recipient names and addresses are subject to change during the term of the contract. The Administrative Project Officer will notify the Contractor in writing of such changes when they occur.

TABLE 1

	Item	No. of Copies	Delivery Schedule	Distribution (1)	(2)	(3)
*A.	Standard Operating Procedures	1	60 days after contract award, and as required in Exhibit E.		As Directed	
B.	Sample Traffic Reports	1	5 working days after receipt of last sample in Sample Delivery Group (SDG).**	X		
C.	Sample Data Package++	1	14 days after VTSR** of last sample in SDG.	X		1
D.	Data in Computer Readable Format++	2	14 days after VTSR of last sample in SDG.	X	X	
E.	Results of Intercomparison Study/PE Sample Analysis Study++	2	14 days after VSTR of last sample in SDG.	X		X
***F.	Complete SDG File ++	1	14 days after VTSR of last sample in SDG.		X	
****G.	Quarterly/ Annual Verification of Instrument Parameters	2	Quarterly: 15th day of January, April, July, October. Annual: 15th day of January.	X	X	

Item	No. of Copies	Delivery Schedule	Distribution (1)	(2)	(3)
*H. Quality Assurance Plan	1	60 days after contract award, and as required in Exhibit E.		As Directed	

Distribution:
(1) Sample Management Office (SMO) - CLASS Contractor
(2) Region-Client
(3) Quality Assurance Technical Support (QATS) Contractor

Note: 1 Contractor-concurrent delivery to QATS may be required upon request by the APO. Retain for 365 days after data submission, and submit within 7 days after receipt of written request by the APO.

Footnotes:

++ DELIVERABLES ARE TO BE REPORTED TOTAL AND COMPLETE. Concurrent delivery is required. Delivery shall be made such that all designated recipients receive the item on the same calendar day. This includes resubmission of both the hardcopy and diskette. The date of delivery of the SDG, or any sample within the SDG, is the date all samples have been delivered. If the deliverables are due on a Saturday, Sunday or Federal holiday, then they shall be delivered on the next business day. Deliverables delivered after this time will be considered late.

* See Exhibit E for description. Time is cited in calendar days.

** VTSR (Validated Time of Sample Receipt) is the date of sample receipt at the Contractor's facility, as recorded on the shipper's delivery receipt and Sample Traffic Report. Sample Delivery Group (SDG) is a group of samples within a Case, received over a period of 14 days or less (seven days or less for 14-day data turnaround contracts) and not exceeding 20 samples. Data for all samples in the SDG are due concurrently. (See SOW Exhibit A, for further description).

*** Complete SDG file will contain the original sample data package plus all of the original documents described in Exhibit B of the Statement of Work under Complete SDG File.

**** Also required in each Sample Data Package.

NOTE: As specified in the Contract Schedule (Government Furnished Supplies and Materials), unless otherwise instructed by the CLP Sample Management Office, the Contractor shall dispose of unused sample volume and used sample bottles/containers no earlier than sixty (60) days following submission of reconciled analytical data.

Distribution Addresses:

(1) USEPA Contract Laboratory Program (CLP)
Sample Management Office (SMO)[1]
P. O. Box 818
Alexandria, VA 22313

For overnight delivery service, use street address:

300 N. Lee Street
Alexandria, VA 22314

[1] The Sample Management Office (SMO) is a contractor-operated facility operating under the CLASS contract.

(2) USEPA REGIONS: The CLP Sample Management Office will provide the Contractor with the list of addressees for the ten EPA Regions. SMO will provide the Contractor with updated Regional address/name lists as necessary throughout the period of the contract and identify other client recipients on a case-by-case basis.

(3) USEPA Contract Laboratory Program (CLP)
Quality Assurance Technical Support (QATS) Laboratory[2]
2700 Chandler Avenue, Building C
Las Vegas, NV 89120
Attn: Data Audit Staff

[2] The Quality Assurance Technical Support (QATS) laboratory is a contractor-operated facility.

SECTION II

REPORT DESCRIPTIONS AND ORDER OF DATA DELIVERABLES

The Contractor laboratory shall provide reports and other deliverables as specified in the Contract Performance/Delivery Schedule (see Contract Schedule, Section F). The required content and form of each deliverable is described in this Exhibit.

All reports and documentation SHALL BE as follows:

- Legible,
- Clearly labeled and completed in accordance with instructions in this Exhibit,
- Arranged in increasing alphanumeric EPA sample number order,
- Paginated sequentially according to instructions in this Exhibit, and
- Double-sided.

If submitted documentation does not conform to the above criteria, the Contractor is required to resubmit such documentation with deficiency(ies) corrected, at no additional cost to the government.

The Contractor shall be prepared to receive the full monthly sample contract requirement at the time of contract award.

Whenever the Contractor is required to submit or resubmit data as a result of an on-site laboratory evaluation or through an Administrative Project Officer (APO)/Technical Project Officer (TPO) action, or through a Regional data reviewer's request, the data shall be clearly marked as ADDITIONAL DATA and shall be sent to the two contractual data recipients (SMO and Region). A cover letter shall be included which describes what data is being delivered, to which EPA Case(s) the data pertains, and <u>who requested the data</u>.

Whenever the Contractor is required to submit or resubmit data as a result of Contract Compliance Screening (CCS) review by SMO, the data shall be sent to the two contractual data recipients (SMO and Region), and in both instances shall be accompanied by a color-coded COVER SHEET (Laboratory Response To Results of Contract Compliance Screening) provided by SMO. Diskette deliverables shall be submitted or resubmitted to SMO and the Region. Revised DC-1 and DC-2 forms shall be resubmitted to SMO and the Region.

Section IV of this Exhibit contains the required Inorganic Analysis Data Reporting Forms in Agency-specified formats; Section III of this Exhibit contains instructions to the Contractor for properly completing all data reporting forms to provide the Agency with all required data. Data elements and field descriptors for reporting data in computer-readable format are contained in Exhibit H.

Descriptions of the requirements for each deliverable item cited in the Contract Performance/Delivery Schedule (see Contract Schedule, Section F) are specified in parts A-G of this Section. Items submitted concurrently shall be arranged in the order listed. Additionally, the components of each item shall be arranged in the order presented herein when the item is submitted.

A. Quality Assurance Plan and Standard Operating Procedures

See Exhibits E and F for requirements.

B. Sample Traffic Reports

Original Sample Traffic Report page marked "Lab Copy for Return to SMO," with lab receipt information and signed with original Contractor signature, shall be submitted for each sample in the Sample Delivery Group.

Traffic Reports (TRs) shall be submitted in Sample Delivery Group (SDG) sets (i.e., TRs for all samples in an SDG shall be clipped together), with an SDG Cover Sheet attached.

The SDG Cover Sheet shall contain the following items:

- Lab name
- Contract number
- Sample Analysis Price - full sample price from contract.
- Case Number
- List of EPA sample numbers of all samples in the SDG, identifying the first and last samples received, and their dates of receipt.

NOTE: When more than one sample is received in the first or last SDG shipment, the "first" sample received would be the sample with the lowest sample number (considering both alpha and numeric designations); the "last" sample received would be the sample with the highest sample number (considering both alpha and numeric designations).

In addition, each Traffic Report shall be clearly marked with the SDG Number, the sample number of the first sample in the SDG (as described in the following paragraph). This information shall be entered below the Lab Receipt Date on the TR.

EPA field sample numbers are six digits in length. If the Contractor receives sample numbers of any other length, contact SMO immediately. The EPA sample number of the first sample received in the SDG is the SDG number. When several samples are received together in the first SDG shipment, the SDG number shall be the lowest sample number (considering both alpha and numeric designations) in the first group of samples received under the SDG. The SDG number is also reported on all data reporting forms. (See Section III, Form Instruction Guide.)

If samples are received at the laboratory with multi-sample Traffic Reports (TRs), all the samples on one multi-sample TR may not necessarily be in the same SDG. In this instance, the Contractor shall make the appropriate number of photocopies of the TR, and submit one copy with each SDG cover sheet.

C. Sample Data Package

The sample data package shall include data for analysis of all samples in one Sample Delivery Group (SDG), including field and analytical samples, reanalyses, blanks, spikes, duplicates, and laboratory control samples. The sample data package shall be complete before submission, shall be consecutively paginated (starting with page number one and ending with the number of all pages in the package), and shall include the following:

1. Cover Page for the Inorganic Analyses Data Package (COVER PAGE -- Inorganic Analyses Data Package), including: laboratory name; laboratory code; contract number; Case No.; Sample Delivery Group (SDG) No.; SAS Number (if appropriate); EPA sample numbers in alphanumeric order showing EPA sample numbers cross-referenced with lab ID numbers; comments, describing in detail any problems encountered in processing the samples in the data package; and completion of the statement on use of ICP background and interelement corrections for the samples.

   The Cover Page shall contain the following statement, verbatim: "I certify that this data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this hardcopy data package and in the computer-readable data submitted on diskette has been authorized by the Laboratory Manager or the Manager's designee, as verified by the following signature." This statement shall be directly followed by the signature of the Laboratory Manager or his designee with a typed line below it containing the signer's name and title, and the date of signature.

   In addition, on a separate piece of paper, the Contractor shall also include any problems encountered, both technical and administrative, the corrective action taken, and the resolution.

   The Contractor shall retain a legible copy of the Sample Data Package for 365 days after submission of the reconciled data package. After this time, the Contractor may dispose of the package.

2. Sample Data

   Sample data shall be submitted with the Inorganic Analysis Data Reporting Forms for all samples in the SDG, arranged in increasing alphanumeric EPA sample number order, followed by the QC analyses data, Quarterly Verification of Instrument Parameters forms, raw data, and copies of the digestion and distillation logs.

a. Results -- Inorganic Analysis Data Sheet [FORM I - IN]

Tabulated analytical results (identification and quantitation) of the specified analytes (Exhibit C). The validation and release of these results is authorized by a specific, signed statement on the Cover Page. If the Laboratory Manager cannot verify all data reported for each sample, he/she shall provide a detailed description of the problems associated with the sample(s) on the Cover Page.

Appropriate concentration units shall be specified and entered on Form I. The quantitative values shall be reported in units of micrograms per liter (ug/L) for aqueous samples and milligrams per kilogram (mg/kg) for solid samples. No other units are acceptable. Results for solid samples shall be reported on a dry weight basis. Analytical results shall be reported to two significant figures if the result value is less than 10; to three significant figures if the value is greater than or equal to 10. Results for percent solids shall be reported to one decimal place. The preceding discussion concerning significant numbers applies to Forms I and X only. For other Forms, follow the instructions specific to those forms as contained in this exhibit.

b. Quality Control Data

1) Initial and Continuing Calibration Verification [FORM II (PART 1) - IN]

2) CRDL Standard for AA and ICP [FORM II (PART 2) - IN]

3) Blanks [FORM III - IN]

4) ICP Interference Check Sample [FORM IV - IN]

5) Spike Sample Recovery [FORM V (PART 1) - IN]

6) Post Digest Spike Sample Recovery [FORM V (PART 2) - IN]

7) Duplicates [FORM VI - IN]

8) Laboratory Control Sample [FORM VII - IN]

9) Standard Addition Results [FORM VIII - IN]

10) ICP Serial Dilutions [FORM IX - IN]

11) Preparation Log [Form XIII - IN]

12) Analysis Run Log [Form XIV - IN]

c. Quarterly Verification of Instrument Parameters

1) Instrument Detection Limits (Quarterly) [FORM X - IN]

2) ICP Interelement Correction Factors (Annually) [FORM XI (PART 1) - IN]

3) ICP Interelement Correction Factors (Annually) [FORM XI (PART 2) - IN

4) ICP Linear Ranges (Quarterly) [FORM XII - IN]

(Note that copies of Quarterly Verification of Instrument Parameters forms for the current quarter shall be submitted with each data package.)

d. Raw Data

For each reported value, the Contractor shall include in the data package all raw data used to obtain that value. This applies to all required QA/QC measurements, instrument standardization, as well as all sample analysis results. This statement does not apply to the Quarterly Verification of Instrument Parameters submitted as a part of each data package. Raw data shall contain all instrument readouts used for the sample results. Each exposure or instrumental reading shall be provided, including those readouts that may fall below the IDL. All AA and ICP instruments shall provide a legible hard copy of the direct real-time instrument readout (i.e., stripcharts, printer tapes, etc.). A photocopy of the instrument's direct sequential readout shall be included. A hardcopy of the instrument's direct instrument readout for cyanide shall be included if the instrumentation has the capability.

The order of raw data in the data package shall be: ICP, Flame AA, Furnace AA, Mercury, and Cyanide. All raw data shall include concentration units for ICP and absorbances or concentration units for flame AA, furnace AA, Mercury and Cyanide. All flame and furnace AA data shall be grouped by element.

Raw data shall be labeled with EPA sample number and appropriate codes, shown in Table 2 following, to unequivocally identify:

1) Calibration standards, including source and prep date.

2) Initial and continuing calibration blanks and preparation blanks.

Table 2
Codes for Labelling Data

Sample	XXXXXX
Sample not part of the SDG	ZZZZZZ
Duplicate	XXXXXXD
Matrix Spike	XXXXXXS
Serial Dilution	XXXXXXL
Analytical Spike	XXXXXXA
Post Digestion/Distillation Spike	XXXXXXA
MSA:	
Zero Addition	XXXXXX0
First Addition	XXXXXX1
Second Addition	XXXXXX2
Third Addition	XXXXXX3
Instrument Calibration Standards:	
ICP	S or S0 for blank standard
Atomic Absorption and Cyanide	S0, S10,...etc.
Initial Calibration Verification	ICV
Initial Calibration Blank	ICB
Continuing Calibration Verification	CCV
Continuing Calibration Blank	CCB
Interference Check Samples:	
Solution A	ICSA
Solution AB	ICSAB
CRDL Standard for AA	CRA
CRDL Standard for ICP	CRI
Laboratory Control Samples:	
Aqueous (Water)	LCSW
Solid (Soil/Sediment)	LCSS
Preparation Blank (Water)	PBW
Preparation Blank (Soil)	PBS
Linear Range Analysis Standard	LRS

Notes:

1. When an analytical spike or MSA is performed on samples other than field samples, the "A", "0", "1", "2" or "3" suffixes shall be the last to be added to the EPA Sample Number. For instance, an analytical spike of a duplicate must be formatted "XXXXXXDA."

2. The numeric suffix that follows the "S" suffix for the standards indicates the true value of the concentration of the standard in ug/L.

3. ICP calibration standards usually consist of several analytes at different concentrations. Therefore, no numeric suffix can follow the ICP calibration standards unless all the analytes in the standard are prepared at the same concentrations. For instance, the blank for ICP shall be formatted "S0."

4. Use suffixes of "0", "1", "2", "3" as appropriate for samples identified with ZZZZZZ on which MSA has been performed to indicate single injections.

3) Initial and continuing calibration verification standards, interference check samples, ICP serial dilution samples, CRDL Standard for ICP and AA, Laboratory Control Sample and post digestion spike.

4) Diluted and undiluted samples (by EPA sample number) and all weights, dilutions and volumes used to obtain the reported values. (If the volumes, weights and dilutions are consistent for all samples in a given SDG, a general statement outlining these parameters is sufficient.)

5) Duplicates.

6) Spikes (indicating standard solutions used, final spike concentrations, and volumes involved). If spike information (source, concentration, volume) is consistent for a given SDG, a general statement outlining these parameters is sufficient.

7) Instrument used, any instrument adjustments, data corrections or other apparent anomalies on the measurement record, including all data voided or data not used to obtain reported values and a brief written explanation.

8) All information for furnace analysis clearly and sequentially identified on the raw data, including EPA sample number, sample and analytical spike data, percent recovery, coefficient of variation, full MSA data, MSA correlation coefficient, slope and intercepts of linear fit, final sample concentration (standard addition concentration), and type of background correction used: BS for Smith-Heiftje, BD for Deuterium Arc, or BZ for Zeeman.

9) Time and date of each analysis. Instrument run logs can be submitted if they contain this information. If the instrument does not automatically provide times of analysis, these shall be manually entered on all raw data for initial and continuing calibration verification and blanks, as well as interference check samples and the CRDL standard for ICP.

10) Integration times for AA analyses.

e. Digestion and Distillation Logs

Logs shall be submitted in the following order: digestion logs for ICP, flame AA, furnace AA and mercury preparations, followed by a copy of the distillation log for cyanide. These logs shall include: (1) date, (2) sample weights and volumes, (3) sufficient information to unequivocally identify which QC samples (i.e., laboratory control sample, preparation blank) correspond to each batch digested, (4)

comments describing any significant sample changes or reactions which occur during preparation, and (5) indication of pH <2 or >12, as applicable.

f. Properly completed Forms DC-1 and DC-2.

3. A copy of the Sample Traffic Reports submitted in Item B for all of the samples in the SDG. The Traffic Reports shall be arranged in increasing EPA Sample Number order, considering both alpha and numeric designations. A legible photocopy of the SDG cover sheet shall also be submitted.

D. Data in Computer Readable Form

The Contractor shall provide a computer-readable copy of the data for all samples in the Sample Delivery Group, as specified in the Contract Performance/Delivery Schedule. Computer-readable data deliverables shall be submitted on an IBM or IBM-compatible, 5.25 inch floppy double-sided, double density 360 K-byte or a high density 1.2 M-byte diskette or on an IBM or IBM-compatible, 3.5 inch double-sided, double density 720 K-byte or a high density 1.44 M-byte diskette. The data shall be recorded in ASCII, text file format, and shall adhere to the file, record and field specifications listed in Exhibit H, Data Dictionary and Format for Data Deliverables in Computer-Readable Format.

When submitted, diskettes shall be packaged and shipped in such a manner that the diskette(s) cannot be bent or folded, and will not be exposed to extreme heat or cold or any type of electromagnetic radiation. The diskette(s) shall be included in the same shipment as the hardcopy data and shall, at a minimum, be enclosed in a diskette mailer.

E. Results of Intercomparison/Performance Evaluation (PE) Sample Analyses

Tabulation of analytical results for Intercomparison/PE Sample analyses include all requirements specified in items C. and D., above.

F. Complete SDG File (CSF)

As specified in the Delivery Schedule, one Complete SDG File (CSF) including the original Sample Data Package shall be delivered to the Region concurrently with delivery of a copy of the Sample Data Package to SMO (delivery to QATS is only required upon written request). The contents of the CSF shall be numbered according to the specifications described in Sections III and IV of Exhibit B. The Document Inventory Sheet, Form DC-2, is contained in Section IV.

The CSF shall contain all original documents where possible. No photocopies of original documents shall be placed in the CSF unless the original data was initially written in a bound notebook, maintained by the Contractor, or the originals were previously submitted to the Agency with another case/SDG in accordance with the requirements described in Exhibit F. The CSF shall contain all original documents specified in Sections III and IV, and Form DC-2 of Exhibit B of the SOW.

The CSF shall consist of the following original documents in addition to the documents in the Sample Data Package:

1. Original Sample Data Package

2. A completed and signed Document Inventory Sheet (Form DC-2)

3. All original shipping documents, including, but not limited to, the following documents:

   a. EPA Chain-of-Custody Record

   b. Airbills

   c. EPA (SMO) Traffic Reports

   d. Sample Tags (if present) sealed in plastic bags.

4. All original receiving documents, including, but not limited to, the following documents:

   a. Form DC-1

   b. Other receiving forms or copies of receiving logbooks.

   c. SDG Cover Sheet

5. All original laboratory records of sample transfer, preparation, and analysis, including, but not limited to, the following documents:

   a. Original preparation and analysis forms or copies of preparation and analysis logbook pages.

   b. Internal sample and sample digestate/distillate transfer chain-of-custody records.

6. All other original case-specific documents in the possession of the laboratory, including, but not limited to, the following documents:

   a. Telephone contact logs.

   b. Copies of personal logbook pages.

   c. All handwritten case-specific notes.

   d. Any other case-specific documents not covered by the above.

   NOTE: All case-related documentation may be used or admitted as evidence in subsequent legal proceedings. Any other case-specific documents generated after the CSF is sent to EPA, as well as copies that are altered in any fashion, are also deliverables to EPA (original to the Region and copies to SMO and QATS).

If the laboratory does submit case-specific documents to EPA after submission of the CSF, the documents shall be numbered as an addendum to the CSF and a revised DC-2 form shall be submitted; or the documents shall be numbered as a new CSF and a new DC-2 form shall be submitted to the Regions only.

G. Quarterly and Annual Verification of Instrument Parameters

The Contractor shall perform and report quarterly verification of instrument detection limits and linear range by the methods specified in Exhibit E for each instrument used under this contract. For the ICP instrumentation, the Contractor shall also perform and report annual interelement correction factors (including method of determination), wavelengths used and integration times. Forms for Quarterly and Annual Verification of Instrument Parameters for the current quarter and year shall be submitted in each SDG data package, using Forms X, XIA, XIB, and XII. Submission of Quarterly/Annual Verification of Instrument Parameters shall include the raw data used to determine those values reported.

H. Corrective Action Procedures

If a Contractor fails to adhere to the requirements detailed in this SOW, a Contractor may expect, but the Agency is not limited to the following actions: reduction of numbers of samples sent under this contract, suspension of sample shipment to the Contractor, data package audit, an on-site laboratory evaluation, remedial performance evaluation sample, and/or contract sanctions, such as a Cure Notice (see Exhibit E for additional details).

SECTION III

FORM INSTRUCTION GUIDE

This section contains specific instructions for the completion of all required Inorganic Data Reporting Forms. This section is organized into the following Parts:

A. General Information and Header Information

B. Cover Page -- Inorganic Analyses Data Package [COVER PAGE - IN]

C. Inorganic Analysis Data Sheet [FORM I - IN]

D. Initial and Continuing Calibration Verification [FORM II (PART 1) - IN]

E. CRDL Standard for AA and ICP [FORM II (PART 2) - IN]

F. Blanks [FORM III - IN]

G. ICP Interference Check Sample [FORM IV - IN]

H. Spike Sample Recovery [FORM V (PART 1) - IN]

I. Post Digest Spike Sample Recovery [FORM V (PART 2) - IN]

J. Duplicates [FORM VI - IN]

K. Laboratory Control Sample [FORM VII - IN]

L. Standard Addition Results [FORM VIII - IN]

M. ICP Serial Dilutions [FORM IX - IN]

N. Instrument Detection Limits (Quarterly) [FORM X - IN]

O. ICP Interelement Correction Factors (Annually) [FORM XI (PART 1) - IN]

P. ICP Interelement Correction Factors (Annually) [FORM XI (PART 2) - IN

Q. ICP Linear Ranges (Quarterly) [FORM XII - IN]

R. Preparation Log [Form XIII - IN]

S. Analysis Run Log [Form XIV - IN]

T. Sample Log-In Sheet [Form DC-1]

U. Document Inventory Sheet [Form DC-2]

A. General Information and Header Information

The data reporting forms presented in Section IV in this Exhibit have been designed in conjunction with the computer-readable data format specified in Exhibit H, Data Dictionary and Format for Data Deliverables in Computer-Readable Format. The specific length of each variable for computer-readable data transmission purposes is given in Exhibit H. Information entered on these forms shall not exceed the size of the field given on the form, including such laboratory-generated items as Lab Name and Lab Sample ID.

Note that on the hardcopy forms (see Section IV), the space provided for entries is greater in some instances than the length prescribed for the variable as written to diskette (see Exhibit H). Greater space is provided on the hardcopy forms for the sake of visual clarity.

Values shall be reported on the hardcopy forms according to the individual form instructions in this section. Each form submitted shall be filled out completely for all analytes before proceeding to the next form of the same type. Do not submit multiple forms in place of one form if the information on those forms can be submitted on one form.

All characters which appear on the data reporting forms presented in the contract (Exhibit B, Section IV) shall be reproduced by the Contractor when submitting data, and the format of the forms submitted shall be identical to that shown in the contract. No information may be added, deleted, or moved from its specified position without prior written approval of the EPA Administrative Project Officer. The names of the various fields and analytes (i.e., "Lab Code," "Aluminum") shall appear as they do on the forms in the contract, including the options specified in the form (i.e., "Matrix (soil/water):" shall appear, not just "Matrix").

All alphabetic entries made onto the forms by the Contractor shall be in UPPERCASE letters (i.e., "LOW", not "Low" or "low"). If an entry does not fill the entire blank space provided on the form, null characters shall be used to remove the remaining underscores that comprise the blank line. (See Exhibit H for additional instructions.) However, do not remove the underscores or vertical bar characters that delineate "boxes" on the forms.

Six pieces of information are common to the header sections of each data reporting form. These are: Lab Name, Contract, Lab Code, Case No., SAS No., and SDG No. This information shall be entered on every form and shall match on all forms.

The "Lab Name" shall be the name chosen by the Contractor to identify the laboratory. It may not exceed 25 characters.

The "Contract" is the number of the EPA contract under which the analyses were performed.

The "Lab Code" is an alphabetic abbreviation of up to 6 characters, assigned by EPA, to identify the laboratory and aid in data processing.

This lab code will be assigned by EPA at the time a contract is awarded, and shall not be modified by the Contractor, except at the direction of EPA.

The "Case No." is the SMO-assigned Case number (to 5 spaces) associated with the sample, and reported on the Traffic Report.

The "SAS No." is the EPA-assigned number for analyses performed under Special Analytical Services. If samples are to be analyzed under SAS only, and reported on these forms, then enter SAS No. and leave Case No. blank. If samples are analyzed according to this SOW (Routine Analytical Services protocol) and have additional SAS requirements, list both Case No. and SAS No. on all forms. If the analyses have no SAS requirements, leave "SAS No." blank. (NOTE: Some samples in an SDG may have a SAS No., while others do not.)

The "SDG No." is the Sample Delivery Group (SDG) number. The SDG number is the EPA Sample Number of the first sample received in the SDG. When several samples are received together in the first SDG shipment, the SDG number shall be the lowest sample number (considering both alpha and numeric designations) in the first group of samples received under the SDG.

The other information common to several of the forms is the "EPA Sample No.". This number appears either in the upper righthand corner of the form, or as the left column of a table summarizing data from a number of samples. When "EPA Sample No." is entered into the triple-spaced box in the upper righthand corner of a form, it shall be centered on the middle line of the three lines that compose the box.

All samples, matrix spikes and duplicates shall be identified with an EPA Sample Number. For samples, matrix spikes and duplicates, the EPA Sample Number is the unique identifying number given in the Traffic Report that accompanied that sample.

In order to facilitate data assessment, the sample suffixes listed in Table 2 must be used.

Other pieces of information are common to many of the Data Reporting Forms. These include: Matrix and Level.

For "Matrix", enter "SOIL" for soil/sediment samples, and enter "WATER" for water samples. NOTE: The matrix must be spelled out. Abbreviations such as "S" or "W" shall not be used.

For "Level", enter the determination of concentration level. Enter as "LOW" or "MED", not "L" or "M".

Note: All results shall be transcribed to Forms II-XIV from the raw data to the specified number of decimal places that are described in Exhibits B and H. The raw data result is to be rounded only when the number of figures in the raw data result exceeds the maximum number of figures specified for that result entry for that form. If there are not enough figures in the raw data result to enter in the specified space

for that result, then zeros shall be used for decimal places to the specified number of reporting decimals for that result for a specific form. The following examples are provided:

Raw Data Result	Specified Format	Correct Entry on Form
95.99653	5.4 (to four decimal places)	95.9965
95.99653	5.3 (to three decimal places)	95.997
95.99653	5.2 (to two decimal places)	96.00
95.996	5.4 (to four decimal places)	95.9960
95.9	5.4 (to four decimal places)	95.9000

For rounding off numbers to the appropriate level of precision, observe the following common rules. If the figure following those to be retained is less than 5, drop it (round down). If the figure is greater than 5, drop it and increase the last digit to be retained by 1 (round up). If the figure following the last digit to be retained equals 5 and there are no digits to the right of the 5 or all digits to the right of the 5 equal zero, then round up if the digit to be retained is odd, or round down if that digit is even. See also Rounding Rules entry in Glossary (Exhibit G).

Before evaluating a number for being in control or out of control of a certain limit (other than the CRDL), the number evaluated shall be rounded using EPA rounding rules to the significance reported for that limit. For instance, the control limit for an ICV is plus or minus 10% of the true value. A reported percent recovery value of 110.4 would be considered in control while a reported value of 110.6 would be considered out of control. In addition, a calculated value of 110.50 would be in control while a calculated value of 110.51 would be out of control.

B. Cover Page - Inorganic Analyses Data Package [COVER PAGE-IN]

This form is used to list all samples analyzed within a Sample Delivery Group, and to provide certain analytical information and general comments. It is also the document which is signed by the Laboratory Manager to authorize and release all data and deliverables associated with the SDG.

Complete the header information according to the instructions in Part A.

For samples analyzed using this SOW, enter "ILM04.0" for SOW No.

Enter the EPA Sample No. (including spikes and duplicates) (to seven spaces) of every sample analyzed within the SDG. Spikes shall contain an "S" suffix and duplicates a "D" suffix. These sample numbers shall be listed on the form in ascending alphanumeric order. Thus, if MAB123 is the lowest (considering both alpha and numeric characters) EPA Sample No. within the SDG, it would be entered in the first EPA Sample No. field. Samples would be listed below it, in ascending sequence - MAB124, MAB125, MAC111, MA1111, MA1111D, etc.

A maximum of twenty (20) sample numbers can be entered on this form. Submit additional Cover Pages, as appropriate, if the total number of samples, duplicates, and spikes in the SDG is greater than twenty (20).

A Lab Sample ID (to ten spaces) may be entered for each EPA Sample No. If a Lab Sample ID is entered, it shall be entered identically (for each EPA Sample No.) on all associated data.

Enter "YES" or "NO" in answer to each of the two questions concerning ICP corrections. Each question shall be explicitly answered with a "YES" or a "NO." The third question shall be answered with a "YES" or "NO" if the answer to the second question is "YES." It shall be left blank if the answer to the second question is "NO."

Under "Comments," enter any statements relevant to the analyses performed under the SDG as a whole.

Each Cover Page shall be signed, in original, by the Laboratory Manager or the Manager's designee and dated, to authorize the release and verify the contents of all data and deliverables associated with an SDG.

C. Inorganic Analysis Data Sheet [FORM I-IN]

This form is used to tabulate and report sample analysis results for target analytes (Exhibit C).

Complete the header information according to the instructions in Part A and as follows.

"Date Received" is the date (formatted MM/DD/YY) of sample receipt at the laboratory, as recorded on the Traffic Report, i.e., the Verified Time of Sample Receipt (VTSR).

"% Solids" is the percent of solids on a weight/weight basis in the sample as determined by drying the sample as specified in Exhibit D. Report percent solids to one decimal place (i.e., 5.3%). If the percent solids is not required because the sample is fully aqueous or less than 1% solids, then enter "0.0."

Enter the appropriate concentration units (UG/L for water or MG/KG dry weight for soil). Entering "MG/KG" means "mg/Kg dry weight" on this form.

Under the column labeled "Concentration," enter for each analyte either the value of the result (if the concentration is greater than or equal to the Instrument Detection Limit) or the Instrument Detection Limit for the analyte corrected for any dilutions (if the concentration is less than the Instrument Detection Limit). The concentration result shall be reported to two significant figures if the result is less than 10; to three significant figures if the value is greater than or equal to 10.

Under the columns labeled "C," "Q," and "M," enter result qualifiers as identified below. If additional qualifiers are used, their explicit definitions shall be included on the Cover Page in the Comments section.

FORM I-IN includes fields for three types of result qualifiers. These qualifiers shall be completed as follows:

- C (Concentration) qualifier -- Enter "B" if the reported value was obtained from a reading that was less than the Contract Required Detection Limit (CRDL) but greater than or equal to the Instrument Detection Limit (IDL). If the analyte was analyzed for but not detected, a "U" shall be entered.

- Q qualifier -- Specified entries and their meanings are as follows:

  E - The reported value is estimated because of the presence of interference. An explanatory note shall be included under Comments on the Cover Page (if the problem applies to all samples) or on the specific FORM I-IN (if it is an isolated problem).

  M - Duplicate injection precision not met.

  N - Spiked sample recovery not within control limits.

  S - The reported value was determined by the Method of Standard Additions (MSA).

  W - Post-digestion spike for Furnace AA analysis is out of control limits (85-115%), while sample absorbance is less than 50% of spike absorbance. (See Exhibit E.)

  * - Duplicate analysis not within control limits.

  + - Correlation coefficient for the MSA is less than 0.995.

  Entering "S," "W," or "+" is mutually exclusive. No combination of these qualifiers can appear in the same field for an analyte.

- M (Method) qualifier -- Enter:

  - "P" for ICP
  - "A" for Flame AA
  - "F" for Furnace AA
  - "PM" for ICP when Microwave Digestion is used
  - "AM" for flame AA when Microwave Digestion is used
  - "FM" for Furnace AA when Microwave Digestion is used
  - "CV" for Manual Cold Vapor AA
  - "AV" for Automated Cold Vapor AA
  - "CA" for Midi-Distillation Spectrophotometric
  - "AS" for Semi-Automated Spectrophotometric
  - "C" for Manual Spectrophotometric
  - "T" for Titrimetric
  - " " where no data have been entered
  - "NR" if the analyte is not required to be analyzed.

A brief physical description of the sample, both before and after digestion, shall be reported in the fields for color (before and after), clarity (before and after), texture and artifacts. For water samples, report color and clarity. For soil samples, report color, texture and artifacts.

The following descriptive terms are recommended:

Color - red, blue, yellow, green, orange, violet, white, colorless, brown, grey, black

Clarity - clear, cloudy, opaque

Texture - fine (powdery), medium (sand), coarse (large crystals or rocks)

If artifacts are present, enter "YES" in the artifacts field and describe the artifacts in the Comments field. If artifacts are not present, leave this field blank.

Note any significant changes that occur during sample preparation (i.e., emulsion formation) in the Comments field. Enter any sample-specific comments concerning the analyte results in the Comments field.

D. Initial and Continuing Calibration Verification [FORM II(PART 1)-IN]

This form is used to report analyte recoveries from calibration solutions.

Complete the header information according to the instructions in Part A and as follows.

Enter the Initial Calibration Source (12 spaces maximum) and the Continuing Calibration Source (12 spaces maximum). Enter EPA as the source of EPA standards. When additional EPA supplied solutions are prepared in the future, the Contractor shall use the codes supplied with those solutions for identification. If other sources were used, enter sufficient information in the available 12 spaces to identify the manufacturer and the solution used.

Use additional FORMs II(PART 1)-IN if more calibration sources were used.

Under "Initial Calibration True," enter the value (in ug/L, to one decimal place) of the concentration of each analyte in the Initial Calibration Verification Solution.

Under "Initial Calibration Found," enter the most recent value (in ug/L, to two decimal places), of the concentration of each analyte measured in the Initial Calibration Verification Solution.

Under "Initial Calibration %R," enter the value (to one decimal place) of the percent recovery computed according to the following equation:

EQ. 2.1

$$\%R = \frac{Found(ICV)}{True(ICV)} \times 100$$

Where, True(ICV) is the true concentration of the analyte in the Initial Calibration Verification Solution and Found(ICV) is the found concentration of the analyte in the Initial Calibration Verification Solution.

The values used in equation 2.1 for True(ICV) and Found(ICV) shall be exactly those reported on this form.

Under "Continuing Calibration True," enter the value (in ug/L, to one decimal place) of the concentration of each analyte in the Continuing Calibration Verification Solution.

Under "Continuing Calibration Found," enter the value (in ug/L, to two decimal places) of the concentration of each analyte measured in the Continuing Calibration Verification Solution.

Note that the form contains two "Continuing Calibration Found" columns. The column to the left shall contain values for the first Continuing Calibration Verification, and the column to the right shall contain values for the second Continuing Calibration Verification. The column to the right should be left blank if no second Continuing Calibration Verification was performed.

If more than one FORM II(PART 1)-IN is required to report multiple Continuing Calibration Verifications, then the column to the left on the second form shall contain values for the third Continuing Calibration Verification, the column to the right shall contain values for the fourth Continuing Calibration Verification, and so on.

Under "Continuing Calibration %R," enter the value (to one decimal place) of the percent recovery computed according to the following equation:

EQ. 2.2

$$\%R = \frac{Found(CCV)}{True(CCV)} \times 100$$

where, True(CCV) is the true concentration of each analyte, and Found(CCV) is the found concentration of the analyte in the Continuing Calibration Verification Solution.

The values used in equation 2.2 for True(CCV) and Found(CCV) shall be exactly those reported on this form.

Note that the form contains two "Continuing Calibration %R" columns. Entries to these columns shall follow the sequence detailed above for entries to the "Continuing Calibration Found" columns.

Under "M," enter the method used or "NR," as explained in Part C.

If more than one wavelength is used to analyze an analyte, submit additional FORMs II(PART 1)-IN as appropriate.

The order of reporting ICVs and CCVs for each analyte shall follow the temporal order in which the standards were run starting with the first Form IIA and moving from the left to the right continuing to the following Form IIAs as appropriate. For instance, the first ICV for all analytes shall be reported on the first Form IIA. In a run where three CCVs were analyzed, the first CCV shall be reported in the left CCV column on the first Form IIA and the second CCV shall be reported in the right column of the same form. The third CCV shall be reported in the left CCV column of the second Form IIA. On the second Form IIA, the ICV column and the right CCV column shall be left empty in this example. In the previous example, if a second run for an analyte was needed, the ICV of that run shall be reported on a third Form IIA and the CCVs follow in the same fashion as explained before. In the case where two wavelengths are used for an analyte, all ICV and CCV results of one wavelength from all runs shall be reported before proceeding to report the results of the second wavelength used.

E. CRDL Standard for AA and ICP [FORM II(PART 2)-IN]

This form is used to report analyte recoveries from analyses of the CRDL Standards for AA (CRA) and 2x the CRDL Standards for ICP (CRI).

Complete the header information according to the instructions in Part A and as follows.

Enter the AA CRDL Standard Source (12 spaces maximum) and the ICP CRDL Standard Source (12 spaces maximum), as explained in Part D.

Under "CRDL Standard for AA True," enter the value (in ug/L, to one decimal place) of the concentration of each analyte in the CRDL Standard Source Solution that was analyzed.

Under "CRDL Standard for AA Found," enter the value (in ug/L, to two decimal places) of the concentration of each analyte measured in the CRDL Standard Solution.

Under "CRDL Standard for AA %R," enter the value (to one decimal place) of the percent recovery computed according to the following equation:

EQ. 2.3

$$\%R = \frac{Found\ CRDL\ Standard\ for\ AA}{True\ CRDL\ Standard\ for\ AA} \times 100$$

Under "CRDL Standard for ICP Initial True," enter the value (to one decimal place) of the concentration of each analyte in the CRDL Standard Solution that was analyzed by ICP for analytical samples associated with the SDG. Concentration units are ug/L.

Under "CRDL Standard for ICP Initial Found," enter the value (to two decimal places) of the concentration of each analyte measured in the CRDL Standard Solution analyzed at the beginning of each run. Concentration units are ug/L.

Under "CRDL Standard for ICP, Initial %R," enter the value (to one decimal place) of the percent recovery computed according to the following equation:

EQ. 2.4

$$\%R = \frac{\textit{CRDL Standard for ICP Initial Found}}{\textit{CRDL Standard for ICP True}} \times 100$$

Under "CRDL Standard for ICP Final Found," enter the value (in ug/L, to two decimal places) of the concentration of each analyte measured in the CRDL Standard Solution analyzed at the end of each run.

Under "CRDL Standard for ICP Final %R," enter the value (to one decimal place) of the percent recovery computed according to the following equation:

EQ. 2.5

$$\%R = \frac{\textit{CRDL Standard for ICP Final Found}}{\textit{CRDL Standard for ICP True}} \times 100$$

All %R values reported in equations 2.3, 2.4, and 2.5 shall be calculated using the exact true and found values reported on this form.

Note that for every initial solution reported there must be a final one. However, the opposite is <u>not</u> true. If a CRDL Standard for ICP (CRI) was required to be analyzed in the middle of a run, it shall be reported in the "Final Found" section of this form.

If more CRI or CRA analyses were required or analyses were performed using more than one wavelength per analyte, submit additional FORMs II(PART 2)-IN as appropriate.

The order of reporting CRAs and CRIs for each analyte shall follow the temporal order in which the standards were run starting with the first Form IIB and continuing to the following Form IIBs as appropriate. The order of reporting CRA and CRI is independent with respect to each other. When multiple wavelengths are used for one analyte, all the results of one wavelength shall be reported before proceeding to the next wavelength.

F. Blanks [FORM III-IN]

This form is used to report analyte concentrations found in the Initial Calibration Blank (ICB), in Continuing Calibration Blanks (CCB), and in the Preparation Blank (PB).

Complete the header information according to the instructions in Part A and as follows.

Enter "SOIL" or "WATER" as appropriate as the matrix of the Preparation Blank. No abbreviations or other matrix descriptors may be used.

According to the matrix specified for the Preparation Blank, enter "UG/L" (for water) or "MG/KG" (for soil) as the Preparation Blank concentration units.

Under "Initial Calib. Blank," enter the concentration (in ug/L, to one decimal place) of each analyte in the most recent Initial Calibration Blank.

Under the "C" qualifier field, for any analyte enter "B" if the absolute value of the analyte concentration is less than the CRDL but greater than or equal to the IDL. Enter "U" if the absolute value of the analyte in the blank is less than the IDL.

Under "Continuing Calibration Blank 1," enter the concentration (in ug/L, to one decimal place) of each analyte detected in the first required Continuing Calibration Blank (CCB) analyzed after the Initial Calibration Blank. Enter any appropriate qualifier, as explained for the "Initial Calibration Blank," to the "C" qualifier column immediately following the "Continuing Calibration Blank 1" column.

If only one Continuing Calibration Blank was analyzed, then leave the columns labeled "2" and "3" blank. If up to three CCBs were analyzed, complete the columns labeled "2" and "3," in accordance with the instructions for the "Continuing Calibration Blank 1" column. If more than three Continuing Calibration Blanks were analyzed, then complete additional FORMs III-IN as appropriate.

Under "Preparation Blank," enter the concentration in ug/L (to three decimal places) for a water blank or in mg/Kg (to three decimal places) for a soil blank, of each analyte in the Preparation Blank. Enter any appropriate qualifier, as explained for the "Initial Calibration Blank," to the "C" qualifier column immediately following the "Preparation Blank" column.

For all blanks, enter the concentration of each analyte (positive or negative) measured above the IDL or below the negative value of the IDL.

For example, arsenic has an IDL of 3 ug/L (CRDL for arsenic is 10 ug/L); therefore, a CCB instrument reading of -6.2485 ug/L will be reported as -6.2B, a CCB instrument reading of -2.4356 ug/L will be reported as 3.0U, a CCB instrument reading of 8.3586 ug/L will be reported as 8.4B, and a CCB instrument reading of 2.1584 ug/L will be reported as 3.0U.

Under "M," enter the method used, as explained in Part C.

If more than one wavelength is used to analyze an analyte, submit additional FORMs III-IN as appropriate.

The order of reporting ICBs and CCBs for each analyte shall follow the temporal order in which the blanks were run starting with the first Form III and moving from left to right and continuing to the following Form IIIs as explained in Part D. When multiple wavelengths are used for the analysis of one analyte, all the results of one wavelength shall be reported before proceeding to the next wavelength.

G. ICP Interference Check Sample [FORM IV-IN]

This form is used to report Interference Check Sample (ICS) results for each ICP instrument used in Sample Delivery Group analyses.

Complete the header information according to the instructions in Part A and as follows:

For "ICP ID Number," enter an identifier that uniquely identifies a specific instrument within the Contractor laboratory. No two ICP instruments within a laboratory may have the same ICP ID Number.

Enter "ICS Source" (12 spaces maximum) as explained in Part D. For EPA solutions, include in the source name a number identifying it (e.g., EPA-LV87).

Under "True Sol. A," enter the true concentration (in ug/L, to the nearest whole number) of each analyte present in Solution A.

Under "True Sol. AB," enter the true concentration (in ug/L, to the nearest whole number) of each analyte present in Solution AB.

Under "Initial Found Sol. A," enter the concentration (in ug/L, to the nearest whole number) of each analyte found in the initial analysis of Solution A as required in Exhibit E.

Under "Initial Found Sol. AB," enter the concentration (in ug/L, to one decimal place) of each analyte in the initial analysis of Solution AB as required in Exhibit E.

Under "Initial Found %R," enter the value (to one decimal place) of the percent recovery computed for true solution AB greater than zero according to the following equation:

EQ. 2.6

$$\%R = \frac{Initial\ Found\ Solution\ AB}{True\ Solution\ AB} \times 100$$

Leave the field blank if true solution AB equals zero.

Under "Final Found Sol. A," enter the concentration (in ug/L, to the nearest whole number) of each analyte found in the final analysis of Solution A as required in Exhibit E.

Under "Final Found Sol. AB," enter the concentration (in ug/L, to one decimal place) of each analyte found in the final analysis of Solution AB as required in Exhibit E.

For All Found values of solutions A and AB, enter the concentration (positive, negative, or zero) of each analyte at each wavelength used for analysis by ICP.

Under "Final Found %R," enter the value (to one decimal place) of the percent recovery computed according to the following equation:

EQ. 2.7

$$\%R = \frac{Final\ Found\ Solution\ AB}{True\ Solution\ AB} \times 100$$

All %R values reported shall be calculated using the exact true and found values reported on this form.

Note that for every initial solution reported there must be a final one. However, the opposite is not true. If an ICS was required to be analyzed in the middle of a run, it shall be reported in the "Final Found" section of this form.

If more ICS analyses were required, submit additional FORMs IV-IN as appropriate.

The order of reporting ICSs for each analyte shall follow the temporal order in which the standards were run starting with the first Form IV and continuing to the following Form IVs as appropriate. When multiple wavelengths are used for one analyte, all the results of one wavelength shall be reported before proceeding to the next wavelength.

H. Spike Sample Recovery [FORM V(PART 1)-IN]

This form is used to report results for the pre-digest spike.

Complete the header information according to the instructions in Part A and as follows.

Indicate the appropriate matrix, level and concentration units (ug/L for water and mg/Kg dry weight for soil) as explained in Parts A and C.

For "%Solids for Sample," enter the percent solids (as explained in Part C) for the original sample of the EPA Sample Number reported on the form. Note that this number must equal the one reported on Form I for that sample.

In the "EPA Sample No." box, enter the EPA Sample Number (7 places maximum) of the sample from which the spike results on this form were obtained. The number shall be centered in the box.

Under "Control Limit %R," enter "75-125" if the spike added value was greater than or equal to one-fourth of the sample result value. If not, leave the field empty.

Under "Spiked Sample Result (SSR)," enter the measured value (to four decimal places), in appropriate units, for each relevant analyte in the matrix spike sample. Enter any appropriate qualifier, as explained in Part C, to the "C" qualifier column immediately following the "Spiked Sample Result (SSR)" column.

Under "Sample Result (SR)," enter the measured value (to four decimal places) for each required analyte in the sample (reported in the EPA Sample No. box) on which the matrix spike was performed. Enter any appropriate qualifier, as explained in Part C, to the "C" qualifier column immediately following the "Sample Result (SR)" column.

Under "Spike Added (SA)," enter the value (to two decimal places) for the concentration of each analyte added to the sample. The same concentration units shall be used for spiked sample results, unspiked (original sample) results, and spike added sample results. If the "spike added" concentration is specified in the contract, the value added and reported shall be that specific concentration in appropriate units, corrected for spiked sample weight and % solids (soils) or spiked sample volume (waters).

Under "%R," enter the value (to one decimal place) of the percent recovery for all spiked analytes computed according to the following equation:

EQ. 2.8

$$\%R = \frac{SSR - SR}{SA} \times 100$$

%R shall be reported, whether it is negative, positive or zero.

The values for SSR, SR, and SA must be exactly those reported on this form. A value of zero shall be used in calculations for SSR or SR if the analyte value is less than the IDL.

Under "Q," enter "N" if the Spike Recovery (%R) is out of the control limits (75-125) and the Spike Added (SA) is greater than or equal to one-fourth of the Sample Result (SR).

Under "M," enter the method used (as explained in Part C) or enter "NR" if the analyte is not required in the spike.

If different samples were used for spike sample analysis of different analytes, additional FORMs V(PART 1)-IN shall be submitted for each sample as appropriate.

I. Post Digest Spike Sample Recovery [FORM V(PART 2)-IN]

This form is used to report results for the post-digest spike recovery which is based upon the addition of a known quantity of analyte to an aliquot of the digested sample.

Complete the header information according to the instructions in Part A and as follows.

In the "EPA Sample No." box, enter the EPA Sample Number (7 spaces maximum) of the sample from which the spike results on this form were obtained. The number shall be centered in the box.

The "Control Limit %R" and "Q" fields shall be left blank until limits are established by EPA. At that time, the Contractor will be informed how to complete these fields.

Under "Spiked Sample Result (SSR)," enter the measured value (in ug/L, to two decimal places) for each analyte in the post-digest spike sample. Enter any appropriate qualifier, as explained in Part C, to the "C" qualifier column immediately following the "Spiked Sample Result (SSR)" column.

Under "Sample Result (SR)," enter the measured value (in ug/L, to two decimal places) for the concentration of each analyte in the sample (reported in the EPA Sample No. box) on which the spike was performed. Enter any appropriate qualifier, as explained in Part C, to the "C" qualifier column immediately following the "Sample Result (SR)" column.

Under "Spike Added (SA)," enter the value (in ug/L, to one decimal place) for each analyte added to the sample. The same concentration units shall be used for spiked sample results, unspiked (original sample) results, and spike added sample results. If the spike added concentration is specified in the contract, the value added and reported shall be that specific concentration in appropriate units.

Under "%R," enter the value (to one decimal place) of the percent recovery for all spiked analytes computed according to Equation 2.8 in Part H.

%R shall be reported, whether it is negative, positive or zero.

The values for SSR, SR, and SA must be exactly those reported on this form. A value of zero shall be substituted for SSR or SR if the analyte value is less than the IDL.

Under "M," enter the method used as explained in Part C, or enter "NR" if the spike was not required.

If different samples were used for spike sample analysis of different analytes, additional FORMs V(PART 1)-IN shall be submitted.

J. Duplicates [FORM VI-IN]

The duplicates form is used to report results of duplicate analyses. Duplicate analyses are required for % solids values and all analyte results.

Complete the header information according to the instructions in Part A and as follows.

Indicate the appropriate matrix, level and concentration units (ug/L for water and mg/Kg dry weight for soil) as explained in Parts A and C.

For "% Solids for Sample," enter the percent solids (as explained in Part C) for the original sample of the EPA Sample Number reported on the form. Note that this number must equal the one reported on Form I for that sample.

For "% Solids for Duplicate," enter the percent solids (as explained in Part C) for the duplicate sample of the EPA Sample Number reported on the form.

In the "EPA Sample No." box, enter the EPA Sample Number (7 spaces maximum) of the sample from which the duplicate sample results on this form were obtained. The number shall be centered in the box.

Under "Control Limit," enter the CRDL (in appropriate units, ug/L for water or mg/Kg dry weight basis compared to the original sample weight and percent solids) for the analyte if the sample or duplicate values were less than 5x CRDL and greater than or equal to the CRDL. If the sample and duplicate values were greater than or equal to 5x CRDL, leave the field empty.

Under Sample (S), enter the original measured value (to four decimal places) for the concentration of each analyte in the sample (reported in the EPA Sample No. box) on which a Duplicate analysis was performed. Concentration units are those specified on the form. Enter any appropriate qualifier, as explained in Part C, to the "C" qualifier column immediately following the "Sample (S)" column.

Under Duplicate (D), enter the measured value (to four decimal places) for each analyte in the Duplicate sample. Concentration units are those specified on the form. Enter any appropriate qualifier, as explained in Part C, to the "C" qualifier column immediately following the "Duplicate (D)" column.

For solid samples, the concentration of the original sample shall be computed using the weight and % solids of the original sample. The concentration of the duplicate sample shall be computed using the weight of the duplicate sample, but the % solids of the original sample.

Under RPD, enter the absolute value (to one decimal place) of the Relative Percent Difference for all analytes detected above the IDL in either the sample or the duplicate, computed according to the following equation:

EQ. 2.9

$$RPD = \frac{|S - D|}{(S + D)/2} \times 100$$

The values for S and D shall be exactly those reported on this form. A value of zero shall be substituted for S or D if the analyte concentration is less than the IDL in either one. If the analyte concentration is less than the IDL in both S and D, leave the RPD field empty.

Under "Q," enter "*" if the duplicate analysis for the analyte is out of control. If both sample and duplicate values are greater than or equal to 5x CRDL, then the RPD must be less than or equal to 20% to be in control. If either sample or duplicate values are less than 5x CRDL, then the absolute difference between the two values must be less than the CRDL to be in control.

If both values are below the CRDL, then no control limit is applicable.

Under "M," enter method used as explained in Part C.

K. Laboratory Control Sample [FORM VII-IN]

This form is used to report results for the solid and aqueous Laboratory Control Samples.

Complete the header information according to the instructions in Part A and as follows.

For the Solid LCS Source (12 spaces maximum), enter the appropriate EPA sample number if the EPA provided standard was used. Substitute an appropriate number provided by the EPA for LCS solutions prepared in the future. If other sources were used, identify the source as explained in Part D. For the Aqueous LCS Source, enter the source name (12 spaces maximum) as explained in Part D.

Under "Aqueous True," enter the value (in ug/L, to one decimal place) of the concentration of each analyte in the Aqueous LCS Standard Source.

Under "Aqueous Found," enter the measured concentration (in ug/L, to two decimal places) of each analyte found in the Aqueous LCS solution.

Under "Aqueous %R," enter the value of the percent recovery (to one decimal place) computed according to the following equation:

EQ. 2.10

$$\%R = \frac{Aqueous\ LCS\ Found}{Aqueous\ LCS\ True} \times 100$$

Under "Solid True," enter the value (in mg/Kg, to one decimal place) of the concentration of each analyte in the Solid LCS Source.

Under "Solid Found," enter the measured value (in mg/Kg, to one decimal place) of each analyte found in the Solid LCS solution.

Under "C," enter "B" or "U" or leave empty, to describe the found value of the solid LCS as explained in Part C.

Under "Limits," enter the lower limit (in mg/Kg, to one decimal place) in the left column, and the upper limit (in mg/Kg, to one decimal place) in the right column, for each analyte in the Solid LCS Solution.

Under "Solid %R," enter the value of the percent recovery (to one decimal place) computed according to the following equation:

EQ. 2.11

$$\%R = \frac{Solid\ LCS\ Found}{Solid\ LCS\ True} \times 100$$

The values for true and found aqueous and solid LCSs used in equations 2.10 and 2.11 shall be exactly those reported on this form. If the analyte concentration is less than the IDL, a value of zero shall be substituted for the solid LCS found.

Submit additional FORMs VII-IN as appropriate, if more than one aqueous LCS or solid LCS was required.

L. Standard Addition Results [FORM VIII-IN]

This form is used to report the results of samples analyzed using the Method of Standard Additions (MSA) for Furnace AA analysis.

Complete the header information according to the instructions in Part A.

Under "EPA Sample No.," enter the EPA Sample Numbers (7 spaces maximum) of all analytical samples analyzed using the MSA. This includes reruns by MSA (if the first MSA was out of control) as explained in Exhibit E.

Note that only field samples and duplicates may be reported on this form, thus the EPA Sample Number usually has no suffix or a "D."

A maximum of 32 samples can be entered on this form. If additional samples required MSA, submit additional FORMs VIII-IN. Samples shall be listed in alphanumeric order per analyte, continuing to the next FORM VIII-IN if applicable.

Under "An," enter the chemical symbol (2 spaces maximum) for each analyte for which MSA was required for each sample listed. The analytes shall be in alphabetical listing of the chemical symbols.

Results for different samples for each analyte shall be reported sequentially, with the analytes ordered according to the alphabetical listing of their chemical symbols. For instance, results for As (arsenic) in samples MAA110, MAA111, and MAA112 would be reported in sequence, followed by the result for Pb (lead) in MAA110, etc.

Under "O ADD ABS," enter the measured value in absorbance units (to three decimal places) for the analyte before any addition is performed.

Under "1 ADD CON," enter the final concentration in ug/L (to two decimal places) of the analyte (excluding sample contribution) after the first addition to the sample analyzed by MSA.

Under "1 ADD ABS," enter the measured value (in the same units and decimal places as "O ADD ABS") of the sample solution spiked with the first addition.

Under "2 ADD CON," enter the final concentration in ug/L (to two decimal places) of the analyte (excluding sample contribution) after the second addition to the sample analyzed by MSA.

Under "2 ADD ABS," enter the measured value (in the same units and decimal places as "O ADD ABS") of the sample solution spiked with the second addition.

Under "3 ADD CON," enter the final concentration in ug/L (to two decimal places) of the analyte (excluding sample contribution) after the third addition to the sample analyzed by MSA.

Under "3 ADD ABS," enter the measured value (in the same units and decimal places as "O ADD ABS") of the sample solution spiked with the third addition.

Note that "O ADD ABS," "1 ADD ABS," "2 ADD ABS," and "3 ADD ABS" must have the same dilution factor.

Under "Final Conc.," enter the final analyte concentration (in ug/L, to one decimal place) in the sample as determined by MSA computed according to the following formula:

EQ. 2.12

$$Final\ Conc. = -(x\text{-}intercept)$$

Note that the final concentration of an analyte does not have to equal the value for that analyte which is reported on FORM I-IN for that sample.

Under "r," enter the correlation coefficient (to four decimal places) that is obtained for the least squares regression line representing the following points (x,y):(0.0, "0 ADD ABS"), ("1 ADD CON," "1 ADD ABS"), ("2 ADD CON," "2 ADD ABS"), ("3 ADD CON," "3 ADD ABS").

Note that the correlation coefficient shall be calculated using the ordinary least squares linear regression (unweighted) according to the following formula:

EQ. 2.13

$$r = \frac{N \sum x_i y_i - \sum x_i \sum y_i}{[N \sum x_i^2 - (\sum x_i)^2]^{1/2} [N \sum y_i^2 - (\sum y_i)^2]^{1/2}}$$

Under "Q," enter "+" if r is less than 0.995. If r is greater than or equal to 0.995, then leave the field empty.

M. ICP Serial Dilutions [FORM IX-IN]

This form is used to report results for ICP serial dilution.

Complete the header information according to the instructions in Part A and as follows.

In the "EPA Sample No." box, enter the EPA Sample Number (7 places maximum) of the sample for which serial dilution analysis results on this form were obtained. The number shall be centered in the box.

Under "Initial Sample Result (I)," enter the measured value (in ug/L, to two decimal places) for each ICP analyte in the undiluted sample (for the EPA sample number reported on this form). Enter any appropriate qualifier, as explained in Part C, to the "C" qualifier column immediately following the "Initial Sample Result (I)" column.

Note that the Initial Sample Concentration for an analyte does not have to equal the value for that analyte reported on FORM I-IN for that sample. It is the value of the analyte concentration (uncorrected for dilution) that is within the linear range of the instrument.

Under "Serial Dilution Result (S)", enter the measured concentration value (in ug/L, to two decimal places) for each ICP analyte in the diluted sample. The value shall be adjusted for that dilution. Enter any appropriate qualifier, as explained in Part B, to the "C" qualifier column immediately following the "Serial Dilution Result (S)" column.

Note that the Serial Dilution Result (S) is obtained by multiplying by five the instrument measured value (in ug/L) of the serially diluted sample and that the "C" qualifier for the serial dilution shall be established based on the serial dilution result before correcting it for the dilution regardless of the value reported on the form.

Under "% Difference," enter the absolute value (to one decimal place) of the percent difference in concentration of required analytes, between

the original sample and the diluted sample (adjusted for dilution) according to the following formula:

EQ. 2.14

$$\% \ Difference = \frac{|I - S|}{I} \ x \ 100$$

The values for I and S used to calculate % Difference in equation 2.14 shall be exactly those reported on this form. A value of zero shall be substituted for S if the analyte concentration is less than the IDL. If the analyte concentration in (I) is less than the IDL concentration, leave "% Difference" field empty.

Under "Q," enter "E" if the % Difference is greater than 10% and the original sample concentration (reported on FORM I-IN) is greater than 50x the IDL reported on FORM X-IN.

Under "M," enter the method of analysis for each analyte as explained in Part C.

N. Instrument Detection Limits (Quarterly) [FORM X-IN]

This form documents the Instrument Detection Limits for each instrument that the laboratory used to obtain data for the Sample Delivery Group. Only the instrument and wavelengths used to generate data for the SDG shall be included.

Although the Instrument Detection Limits (IDLs) are determined quarterly (i.e., January, April, July, October) a copy of the quarterly instrument detection limits shall be included with each SDG data package on FORM(s) X-IN.

Complete the header information according to the instructions in Part A and as follows.

Enter the date (formatted MM/DD/YY) on which the IDL values were obtained (or became effective).

Enter ICP ID Number, Flame AA ID Number, and Furnace AA ID Number (12 spaces maximum each). These ID Numbers are used to uniquely identify each instrument that the laboratory uses to do CLP work.

Enter the Mercury instrument ID number in the Flame AA ID Number field.

Enter the Cyanide instrument ID number in the Flame AA ID Number field.

Under "Wavelength," enter the wavelength in nanometers (to two decimal places) for each analyte for which an Instrument Detection Limit (IDL) has been established and is listed in the IDL column. If more than one wavelength is used for an analyte, use other FORMs X-IN as appropriate to report the Instrument Detection Limit.

Under "Background," enter the type of background correction used to obtain Furnace AA data. Enter "BS" for Smith Hieftje, "BD" for Deuterium Arc, or "BZ" for Zeeman background correction.

Contract Required Detection Limits (in ug/L) as established in Exhibit C, shall appear in the column headed "CRDL."

Under "IDL," enter the Instrument Detection Limit (ug/L, to one decimal place) as determined by the laboratory for each analyte analyzed by the instrument for which the ID Number is listed on this form. When calculating IDL values, always round up to the appropriate significant figure. This deviation from the EPA rounding rule is necessary to prevent the reporting of detected values for results that fall in the noise region of the calibration curve.

Under "M," enter the method of analysis used to determine the instrument detection limit for each wavelength used. Use appropriate codes as explained in Part C.

Use additional FORMs X-IN if more instruments and wavelengths are used. Note that the date on this form shall not exceed the analysis dates in the SDG data package or precede them by more than three months.

Use the Comments section to indicate alternative wavelengths and the conditions under which they are used.

O. ICP Interelement Correction Factors (Annually) [FORM XI(PART 1)-IN]

This form documents for each ICP instrument the interelement correction factors applied by the Contractor laboratory to obtain data for the Sample Delivery Group.

Although the correction factors are determined annually (every twelve calendar months), a copy of the results of the annual interelement correction factors shall be included with each SDG data package on FORM XI(PART 1)-IN, and FORM XI(PART 2)-IN as appropriate.

Complete the header information according to instructions in Part A and as follows.

Enter the ICP ID Number (12 spaces maximum), which is a unique number designated by the laboratory to identify each ICP instrument used to produce data in the SDG package. If more than one ICP instrument is used, submit additional FORMs XI(PART 1)-IN as appropriate.

Report the date (formatted as MM/DD/YY) on which these correction factors were determined for use. This date shall not exceed the ICP analysis dates in the SDG data package or precede them by more than twelve calendar months.

Under "Wavelength," list the wavelength in nanometers (to two decimal places) used for each ICP analyte. If more than one wavelength is used, submit additional FORMs XI(PART 1)-IN or FORMs XI(PART 2)-IN, as appropriate.

Under "Al," "Ca," "Fe," and "Mg" enter the correction factor (negative, positive or zero, to seven decimal places, 10 spaces maximum) for each ICP analyte. If correction factors for another analyte are applied, use the empty column and list the analyte's chemical symbol in the blank two-space header field provided for that column.

If corrections are not applied for an analyte, a zero shall be entered for that analyte to indicate that the corrections were determined to be zero. If correction factors are applied for more than one additional analyte, use FORM XI(PART 2)-IN, as appropriate.

P. ICP Interelement Correction Factors (Annually) [FORM XI(PART 2)-IN,]

This form is used if correction factors for analytes other than Al, Ca, Fe, Mg, and one more analyte of the Contractor's choice were applied to the analytes analyzed by ICP. Complete this form as for FORM XI(PART 1)-IN by listing the chemical symbol for additional analytes in the heading of the empty columns in the two-space fields provided.

Columns of correction factors for additional analytes shall be entered left to right starting on FORM XI(PART 1)-IN and proceeding to FORM XI(PART 2)-IN, according to the alphabetical order of their chemical symbols. Note that correction factors for Al, Ca, Fe, and Mg, are all required and are to be listed first (as they appear on FORM XI(PART 1)-IN).

Q. ICP Linear Ranges (Quarterly) [FORM XII-IN]

This form documents the quarterly linear range analysis for each ICP instrument that the laboratory used to obtain data for the SDG.

Complete the header information according to the instructions in Part A and as follows.

Enter the ICP ID Number (12 spaces maximum), which is a unique number designated by the Contractor to identify each ICP instrument used to produce data for the SDG. If more than one ICP instrument is used, submit additional FORMs XII-IN as appropriate.

Report the date (formatted as MM/DD/YY) on which these linear ranges were determined for use. This date shall not exceed the dates of analysis by ICP in the SDG data package and shall not precede the analysis dates by more than three calendar months.

Under "Integ. Time (Sec.)," enter the integration time (in seconds to two decimal places) used for each measurement taken from the ICP instrument.

Under "Concentration," enter the concentration (in ug/L) that is the upper limit of the ICP instrument linear range as determined in Exhibit E. Any measurement in the SDG data package at or below this concentration is within the linear range. Any measurement above it is out of the linear range, and thus, is an estimated value and shall be diluted into the linear range.

Under "M," enter the method of analysis for each analyte as explained in Part C.

If more instruments or analyte wavelengths are used, submit additional FORMs XII-IN as appropriate.

R. Preparation Log [Form XIII-IN]

This Form is used to report the preparation run log.

All field samples and all quality control preparations (including duplicates, matrix spikes, LCSs, PBs and repreparations) associated with the SDG shall be reported on Form XIII.

Submit one Form XIII per batch, per method, if no more than thirty-two preparations, including quality control preparations, were performed. If more than thirty-two preparations per batch, per method, were performed, then submit additional copies of Form XIII as appropriate. Submit a separate Form XIII for each batch.

The order in which the Preparation Logs are submitted is very important. Form XIII shall be organized by method, by batch. Later batches within a method shall follow earlier ones. Each batch shall start on a separate Form XIII.

Complete the header information according to the instructions in Part A, and as follows:

For "Method," enter the method of analysis (two characters maximum) for which the preparations listed on the Form were made. Use appropriate method codes as specified in Part C.

Under "EPA Sample No.," enter the EPA Sample Number of each sample in the SDG, and of all other preparations such as duplicates, matrix spikes, LCSs, PBs, and repreparations (all formatted according to Table 2). All EPA Sample Numbers shall be listed in ascending alphanumeric order, continuing to the next Form XIII if applicable.

Under "Preparation Date," enter the date (formatted MM/DD/YY) on which each sample was prepared for analysis by the method indicated in the header section of the Form.

Note that the date never changes on a single Form XIII because the form shall be submitted per batch.

Under "Weight," enter the wet weight (in grams, to two decimal places) of each soil sample prepared for analysis by the method indicated in the header section of the Form. If the sample matrix is water, then leave the field empty.

Under "Volume," enter the final volume (in mL, to the nearest whole number) of the preparation for each sample prepared for analysis by the method indicated in the header section of the Form. This field shall have a value for each sample listed.

S. Analysis Run Log [Form XIV-IN]

This Form is used to report the sample analysis run log.

A run is defined as the totality of analyses performed by an instrument throughout the sequence initiated by, and including, the first SOW-required calibration standard and terminated by, and including, the continuing calibration verification and blank following the last SOW-required analytical sample.

All field samples and all quality control analyses (including calibration standards, ICVs, CCVs, ICBs, CCBs, CRAs, CRIs, ICSs, LRSs, LCSs, PBs, duplicates, serial dilutions, pre-digestion spikes, post-digestion spikes, analytical spikes, and each addition analyzed for the method of standard addition determination) associated with the SDG shall be reported on Form XIV. The run shall be continuous and inclusive of all analyses performed on the particular instrument during the run.

Submit one Form XIV per run if no more than thirty-two (32) analyses, including instrument calibration, were analyzed in the run. If more than thirty-two analyses were performed in the run, submit additional Forms XIV as appropriate.

The order in which the Analysis Run Logs are submitted is very important. Form XIV shall be organized by method, by run. Later runs within a method shall follow earlier ones. Each analytical run shall start on a separate Form XIV. Therefore, instrument calibration shall be the first entry on the form for each new run. In addition, the run is considered to have ended if it is interrupted for any reason, including termination for failing QC parameters.

Complete the header information according to the instructions in Part A, and as follows:

For "Instrument ID Number," enter the instrument ID number (12 spaces maximum) which shall be an identifier designated by the laboratory to uniquely identify each instrument used to produce data which are required to be reported in the SDG deliverable. If more than one instrument is used, submit additional Forms XIV as appropriate.

For "Method," enter the method code (two characters maximum) according to the specifications in Part C.

For "Start Date," enter the date (formatted MM/DD/YY) on which the analysis run was started.

For "End Date," enter the date (formatted MM/DD/YY) on which the analysis run was ended.

Under "EPA Sample No.," enter the EPA sample number of each analysis, including all QC operations applicable to the SDG (formatted according to Table 2). All EPA Sample Numbers shall be listed in increasing temporal (date and time) order of analysis, continuing to the next Form XIV for the instrument run if applicable. The analysis date and time of

other analyses not associated with the SDG, but analyzed by the instrument in the reported analytical run, shall be reported. Those analyses shall be identified with the EPA Sample No. of "ZZZZZZ."

Under "D/F," enter the dilution factor (to two decimal places) by which the final digestate or distillate needed to be diluted for each analysis to be performed. The dilution factor does not include the dilution inherent in the preparation as specified by the preparation procedures in Exhibit D.

The dilution factor is required for all entries on Form XIV.

Note that for a particular sample a dilution factor of "1" shall be entered if the digestate or distillate was analyzed without adding any further volume of dilutant or any other solutions to the "Volume" or an aliquot of the "Volume" listed on Form XIII for that sample.

For EPA supplied solutions such as ICVs, ICSs, and LCSs, a dilution factor shall be entered if the supplied solution had to be diluted to a dilution different from that specified by the instructions provided with the solution. The dilution factor reported in such a case shall be that which would make the reported true values on the appropriate form for the solution equal those that were supplied with the solution by the EPA. For instance, ICV-2(0887) has a true value of 104.0 ug/L at a 20 fold dilution. If the solution is prepared at a 40 fold dilution, a dilution factor of "2" shall be entered on Form XIV and the uncorrected instrument reading is compared to a true value of 52 ug/L. In this example, Form II will have a true value of 104.0 regardless of the dilution used. The found value for the ICV shall be corrected for the dilution listed on Form XIV using the following formula:

EQ. 2.15

$$\textit{Found value on Form II} = \textit{Instrument readout}\ (\textit{ug/L}) \times \textit{D/F}$$

Under "Time," enter the time (in military format - HHMM) at which each analysis was performed. If an autosampler is used with equal analysis time and intervals between analyses, then only the start time of the run (the time of analysis of the first calibration standard) and end time of the run (the time of analysis of the final CCV or CCB, whichever is later) need to be reported.

Under "% R," enter the percent recovery (to one decimal place) for each Furnace AA analytical spike analyzed. If the analytical spike was performed on more than one analyte, use additional Forms XIV as appropriate. Leave the "% R" field empty if the analysis reported is not for an analytical spike. %R shall be recorded even if the result is not used.

A %R value of "-9999.9" shall be entered for the analytical spike if either the sample or analytical results are greater than the calibration range of the instrument.

Under "Analytes," enter "X" in the column of the designated analyte to indicate that the analyte value was used from the reported analysis to report data in the SDG. Leave the column empty for each analyte if the analysis was not used to report the particular analyte.

Entering "X" appropriately is very important. The "X" is used to link the samples with their related QC. It also links the dilution factor with the appropriate result reported on Forms I-IX. For each analyte result reported on any of the Forms I-IX, there shall be one, and only one, properly identified entry on Form XIV for which an "X" is entered in the column for that analyte.

T. Sample Log-In Sheet [Form DC-1]

This form is used to document the receipt and inspection of samples and containers. One original of Form DC-1 is required for each sample shipping container, e.g., cooler. If the samples in a single sample shipping container must be assigned to more than one Sample Delivery Group, the original Form DC-1 shall be placed with the deliverables for the Sample Delivery Group of the lowest Arabic number and a copy of Form DC-1 shall be placed with the deliverables for the other Sample Delivery Group(s). The copies should be identified as "copy(ies)," and the location of the original should be noted on the copies.

Sign and date the airbill (if present). Examine the shipping container and record the presence/absence of custody seals and their condition (i.e., intact, broken) in item 1 on Form DC-1. Record the custody seal numbers in item 2.

Open the container, remove the enclosed sample documentation, and record the presence/absence of chain-of-custody record(s), EPA forms (i.e., Traffic Reports, Packing Lists), and airbills or airbill stickers in items 3-5 on Form DC-1. Specify if there is an airbill present or an airbill sticker in item 5 on Form DC-1. Record the airbill or sticker number in item 6.

Remove the samples from the shipping container(s), examine the samples and the sample tags (if present), and record the condition of the sample bottles (i.e., intact, broken, leaking) and presence or absence of sample tags in items 7 and 8 on Form DC-1.

Review the sample shipping documents and complete the header information described in Part A. Compare the information recorded on all the documents and samples and mark the appropriate answer in item 9 on Form DC-1.

If there are no problems observed during receipt, sign and date (include time) Form DC-1, the chain-of-custody record, and Traffic Report, and write the sample numbers on Form DC-1. Record the appropriate sample tags and assigned laboratory numbers if applicable. The log-in date should be recorded at the top of Form DC-1 and the date and time of cooler receipt at the laboratory should be recorded in items 10 and 11. Cross out unused columns and spaces.

If there are problems observed during receipt, contact SMO and document the contact as well as resolution of the problem on a CLP Communication Log. Following resolution, sign and date the forms as specified in the preceding paragraph and note, where appropriate, the resolution of the problem.

Record the fraction designation (if appropriate) and the specific area designation (e.g., refrigerator number) in the Sample Transfer block located in the bottom left corner of Form DC-1. Sign and date the sample transfer block.

U. Document Inventory Sheet (Form DC-2)

This form is used to record the inventory of the Complete SDG File (CSF) documents which are sent to the Region.

Organize all EPA-CSF documents as described in Exhibit B, Section II and Section III. Assemble the documents in the order specified on Form DC-2 and Section II, and stamp each page with the consecutive number. (Do not number Form DC-2). Inventory the CSF by reviewing the document numbers and recording page number ranges in the columns provided on Form DC-2. If there are no documents for a specific document type, enter an "NA" in the empty space.

Certain laboratory-specific documents related to the CSF may not fit into a clearly defined category. The laboratory should review Form DC-2 to determine if it is most appropriate to place them under Categories 29, 30, 31, or 32. Category 32 should be used if there is no appropriate previous category. These types of documents should be described or listed in the blanks under each appropriate category.

If it is necessary to insert new or inadvertently omitted documents prior to providing CSFs as first deliverables, the Contractor shall follow these steps:

a. Number all documents to be inserted with the next sequential numbers and file the inserts in their logical positions within the CSF (e.g., file document 1000 between documents 6 and 7).

b. Identify where the inserts are filed in the CSF by recording the document numbers and their locations under the "Other Records" section of Form DC-2 (e.g., document 1000 is filed between 6 and 7).

SECTION IV

DATA REPORTING FORMS

U.S. EPA - CLP

COVER PAGE - INORGANIC ANALYSES DATA PACKAGE

Lab Name: _____ Contract: _____

Lab Code: _____ Case No.: _____ SAS No.: _____ SDG No.: _____

SOW No.: _____

EPA Sample No.	Lab Sample ID.

Were ICP interelement corrections applied? Yes/No ___

Were ICP background corrections applied? Yes/No ___

If yes-were raw data generated before application of background corrections? Yes/No ___

Comments:

_____

_____

_____

_____

I certify that this data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this hardcopy data package and in the computer-readable data submitted on diskette has been authorized by the Laboratory Manager or the Manager's designee, as verified by the following signature.

Signature:_____ Name: _____

Date: _____ Title: _____

1

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

Lab Name: _____ Contract: _____

Lab Code: _____ Case No.: _____ SAS No.: _____ SDG No.: _____

Matrix (soil/water): _____ Lab Sample ID: _____

Level (low/med): _____ Date Received: _____

% Solids: _____

Concentration Units (ug/L or mg/kg dry weight): _____

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				
7440-36-0	Antimony				
7440-38-2	Arsenic				
7440-39-3	Barium				
7440-41-7	Beryllium				
7440-43-9	Cadmium				
7440-70-2	Calcium				
7440-47-3	Chromium				
7440-48-4	Cobalt				
7440-50-8	Copper				
7439-89-6	Iron				
7439-92-1	Lead				
7439-95-4	Magnesium				
7439-96-5	Manganese				
7439-97-6	Mercury				
7440-02-0	Nickel				
7440-09-7	Potassium				
7782-49-2	Selenium				
7440-22-4	Silver				
7440-23-5	Sodium				
7440-28-0	Thallium				
7440-62-2	Vanadium				
7440-66-6	Zinc				
	Cyanide				

Color Before: _____ Clarity Before: _____ Texture: _____

Color After: _____ Clarity After: _____ Artifacts: _____

Comments:

_____

_____

_____

_____

U.S. EPA - CLP

2A
INITIAL AND CONTINUING CALIBRATION VERIFICATION

Lab Name: _____ Contract: _____

Lab Code: _____ Case No.: _____ SAS No.: _____ SDG No.: _____

Initial Calibration Source: _____

Continuing Calibration Source: _____

Concentration Units: ug/L

	Initial Calibration			Continuing Calibration					
Analyte	True	Found	%R(1)	True	Found	%R(1)	Found	%R(1)	M
Aluminum									
Antimony									
Arsenic									
Barium									
Beryllium									
Cadmium									
Calcium									
Chromium									
Cobalt									
Copper									
Iron									
Lead									
Magnesium									
Manganese									
Mercury									
Nickel									
Potassium									
Selenium									
Silver									
Sodium									
Thallium									
Vanadium									
Zinc									
Cyanide									

(1) Control Limits: Mercury 80-120; Other Metals 90-110; Cyanide 85-115

2B
CRDL STANDARD FOR AA AND ICP

Lab Name: _____ Contract: _____

Lab Code: _____ Case No.: _____ SAS No.: _____ SDG No.: _____

AA CRDL Standard Source: _____

ICP CRDL Standard Source: _____

Concentration Units: ug/L

	CRDL Standard for AA			CRDL Standard for ICP					
				Initial			Final		
Analyte	True	Found	%R	True	Found	%R	Found	%R	
Aluminum									
Antimony									
Arsenic									
Barium									
Beryllium									
Cadmium									
Calcium									
Chromium									
Cobalt									
Copper									
Iron									
Lead									
Magnesium									
Manganese									
Mercury									
Nickel									
Potassium									
Selenium									
Silver									
Sodium									
Thallium									
Vanadium									
Zinc									

Control Limits: no limits have been established by EPA at this time

3
BLANKS

Lab Name: _____ Contract: _____

Lab Code: _____ Case No.: _____ SAS No.: _____ SDG No.: _____

Preparation Blank Matrix (soil/water): _____

Preparation Blank Concentration Units (ug/L or mg/kg): _____

Analyte	Initial Calib. Blank (ug/L)	C	Continuing Calibration Blank (ug/L) 1	C	2	C	3	C	Prepa-ration Blank	C	M
Aluminum											
Antimony											
Arsenic											
Barium											
Beryllium											
Cadmium											
Calcium											
Chromium											
Cobalt											
Copper											
Iron											
Lead											
Magnesium											
Manganese											
Mercury											
Nickel											
Potassium											
Selenium											
Silver											
Sodium											
Thallium											
Vanadium											
Zinc											
Cyanide											

4

ICP INTERFERENCE CHECK SAMPLE

Lab Name: _____ Contract: _____

Lab Code: _____ Case No.: _____ SAS No.: _____ SDG No.: _____

ICP ID Number: _____ ICS Source: _____

Concentration Units: ug/L

Analyte	True Sol. A	True Sol. AB	Initial Found Sol. A	Initial Found Sol. AB	Initial Found %R	Final Found Sol. A	Final Found Sol. AB	Final Found %R
Aluminum								
Antimony								
Arsenic								
Barium								
Beryllium								
Cadmium								
Calcium								
Chromium								
Cobalt								
Copper								
Iron								
Lead								
Magnesium								
Manganese								
Mercury								
Nickel								
Potassium								
Selenium								
Silver								
Sodium								
Thallium								
Vanadium								
Zinc								

U.S. EPA - CLP

5A
SPIKE SAMPLE RECOVERY

EPA SAMPLE NO.
_____

Lab Name: _____ Contract: _____

Lab Code: _____ Case No.: _____ SAS No.: _____ SDG No.: _____

Matrix (soil/water): _____ Level (low/med): _____

% Solids for Sample: _____

Concentration Units (ug/L or mg/kg dry weight): _____

Analyte	Control Limit %R	Spiked Sample Result (SSR)	C	Sample Result (SR)	C	Spike Added (SA)	%R	Q	M
Aluminum									
Antimony									
Arsenic									
Barium									
Beryllium									
Cadmium									
Calcium									
Chromium									
Cobalt									
Copper									
Iron									
Lead									
Magnesium									
Manganese									
Mercury									
Nickel									
Potassium									
Selenium									
Silver									
Sodium									
Thallium									
Vanadium									
Zinc									
Cyanide									

Comments:

_____
_____
_____
_____

5B

POST DIGEST SPIKE SAMPLE RECOVERY

EPA SAMPLE NO.

Lab Name: _____ Contract: _____

Lab Code: _____ Case No.: _____ SAS No.: _____ SDG No.: _____

Matrix (soil/water): _____ Level (low/med): _____

Concentration Units: ug/L

Analyte	Control Limit %R	Spiked Sample Result (SSR)	C	Sample Result (SR)	C	Spike Added (SA)	%R	Q	M
Aluminum									
Antimony									
Arsenic									
Barium									
Beryllium									
Cadmium									
Calcium									
Chromium									
Cobalt									
Copper									
Iron									
Lead									
Magnesium									
Manganese									
Mercury									
Nickel									
Potassium									
Selenium									
Silver									
Sodium									
Thallium									
Vanadium									
Zinc									
Cyanide									

Comments:

_____

_____

_____

_____

6
DUPLICATES

EPA SAMPLE NO.
_____

Lab Name: _____ Contract: _____

Lab Code: _____ Case No.: _____ SAS No.: _____ SDG No.: _____

Matrix (soil/water): _____ Level (low/med): _____

% Solids for Sample: _____ % Solids for Duplicate: _____

Concentration Units (ug/L or mg/kg dry weight): _____

Analyte	Control Limit	Sample (S)	C	Duplicate (D)	C	RPD	Q	M
Aluminum								
Antimony								
Arsenic								
Barium								
Beryllium								
Cadmium								
Calcium								
Chromium								
Cobalt								
Copper								
Iron								
Lead								
Magnesium								
Manganese								
Mercury								
Nickel								
Potassium								
Selenium								
Silver								
Sodium								
Thallium								
Vanadium								
Zinc								
Cyanide								

7

LABORATORY CONTROL SAMPLE

Lab Name: _____ Contract: _____

Lab Code: _____ Case No.: _____ SAS No.: _____ SDG No.: _____

Solid LCS Source: _____

Aqueous LCS Source: _____

Analyte	Aqueous (ug/L) True	Found	%R	Solid (mg/kg) True	Found	C	Limits	%R
Aluminum								
Antimony								
Arsenic								
Barium								
Beryllium								
Cadmium								
Calcium								
Chromium								
Cobalt								
Copper								
Iron								
Lead								
Magnesium								
Manganese								
Mercury								
Nickel								
Potassium								
Selenium								
Silver								
Sodium								
Thallium								
Vanadium								
Zinc								
Cyanide								

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8

STANDARD ADDITION RESULTS

Lab Name: ____________________________ Contract: ___________

Lab Code: ______ Case No.: _____ SAS No.: ______ SDG No.: ______

Concentration Units: ug/L

EPA Sample No.	An	0 ADD ABS	1 ADD CON	1 ADD ABS	2 ADD CON	2 ADD ABS	3 ADD CON	3 ADD ABS	Final Conc.	r	Q

9

ICP SERIAL DILUTIONS

EPA SAMPLE NO.

Lab Name: _____ Contract: _____

Lab Code: _____ Case No.: _____ SAS No.: _____ SDG No.: _____

Matrix (soil/water): _____ Level (low/med): _____

Concentration Units: ug/L

Analyte	Initial Sample Result (I)	C	Serial Dilution Result (S)	C	% Difference	Q	M
Aluminum							
Antimony							
Arsenic							
Barium							
Beryllium							
Cadmium							
Calcium							
Chromium							
Cobalt							
Copper							
Iron							
Lead							
Magnesium							
Manganese							
Mercury							
Nickel							
Potassium							
Selenium							
Silver							
Sodium							
Thallium							
Vanadium							
Zinc							

10

INSTRUMENT DETECTION LIMITS (QUARTERLY)

Lab Name: _____Contract: _____

Lab Code: _____Case No.: _____SAS No.: _____SDG No.: _____

ICP ID Number: _____Date: _____

Flame AA ID Number: _____

Furnace AA ID Number: _____

Analyte	Wave-length (nm)	Back-ground	CRDL (ug/L)	IDL (ug/L)	M
Aluminum			200		
Antimony			60		
Arsenic			10		
Barium			200		
Beryllium			5		
Cadmium			5		
Calcium			5000		
Chromium			10		
Cobalt			50		
Copper			25		
Iron			100		
Lead			3		
Magnesium			5000		
Manganese			15		
Mercury			0.2		
Nickel			40		
Potassium			5000		
Selenium			5		
Silver			10		
Sodium			5000		
Thallium			10		
Vanadium			50		
Zinc			20		
Cyanide			10		

Comments:

_____

_____

_____

_____

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11A
ICP INTERELEMENT CORRECTION FACTORS (ANNUALLY)

Lab Name: _____ Contract: _____

Lab Code: _____ Case No.: _____ SAS No.: _____ SDG No.: _____

ICP ID Number: _____ Date: _____

Analyte	Wave-length (nm)	Interelement Correction Factors for: Al	Ca	Fe	Mg	___
Aluminum						
Antimony						
Arsenic						
Barium						
Beryllium						
Cadmium						
Calcium						
Chromium						
Cobalt						
Copper						
Iron						
Lead						
Magnesium						
Manganese						
Mercury						
Nickel						
Potassium						
Selenium						
Silver						
Sodium						
Thallium						
Vanadium						
Zinc						

Comments:

_____

_____

_____

_____

11B
ICP INTERELEMENT CORRECTION FACTORS (ANNUALLY)

Lab Name: _____ Contract: _____

Lab Code: _____ Case No.: _____ SAS No.: _____ SDG No.: _____

ICP ID Number: _____ Date: _____

Analyte	Wave-length (nm)	Interelement Correction Factors for: ___	___	___	___	___
Aluminum						
Antimony						
Arsenic						
Barium						
Beryllium						
Cadmium						
Calcium						
Chromium						
Cobalt						
Copper						
Iron						
Lead						
Magnesium						
Manganese						
Mercury						
Nickel						
Potassium						
Selenium						
Silver						
Sodium						
Thallium						
Vanadium						
Zinc						

Comments:

_____

_____

_____

_____

12

ICP LINEAR RANGES (QUARTERLY)

Lab Name: _____ Contract: _____

Lab Code: _____ Case No.: _____ SAS No.: _____ SDG No.: _____

ICP ID Number: _____ Date: _____

Analyte	Integ. Time (Sec.)	Concentration (ug/L)	M
Aluminum			
Antimony			
Arsenic			
Barium			
Beryllium			
Cadmium			
Calcium			
Chromium			
Cobalt			
Copper			
Iron			
Lead			
Magnesium			
Manganese			
Mercury			
Nickel			
Potassium			
Selenium			
Silver			
Sodium			
Thallium			
Vanadium			
Zinc			

Comments:

_____

_____

_____

_____

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13
PREPARATION LOG

Lab Name:____________________________ Contract:____________

Lab Code: _________ Case No.: _______ SAS No.: ________ SDG No.: ________

Method: ____

EPA Sample No.	Preparation Date	Weight (gram)	Volume (mL)

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14
ANALYSIS RUN LOG

Lab Name: ______________________________ Contract: __________

Lab Code: _______ Case No.: _______ SAS No.: _______ SDG No.: _______

Instrument ID Number: _______________ Method: __

Start Date: __________ End Date: __________

EPA Sample No.	D/F	Time	% R	Analytes																							
				AL	SB	AS	BA	BE	CD	CA	CR	CO	CU	FE	PB	MG	MN	HG	NI	K	SE	AG	NA	TL	V	ZN	CN

SAMPLE LOG-IN SHEET

Lab Name					Page _____ of _____
Received By (Print Name)					Log-in Date
Received By (Signature)					
Case Number		Sample Delivery Group No.			SAS Number
Remarks:		EPA Sample #	Corresponding Sample Tag #	Corresponding Assigned Lab #	Remarks: Condition of Sample Shipment, etc.
1. Custody Seal(s)	Present/Absent* Intact/Broken				
2. Custody Seal Nos.	_____ _____				
3. Chain-of Custody Records	Present/Absent*				
4. Traffic Reports or Packing Lists	Present/Absent*				
5. Airbill	Airbill/Sticker Present/Absent*				
6. Airbill No.	_____ _____				
7. Sample Tags	Present/Absent*				
Sample Tag Numbers	Listed/Not Listed on Chain-of-Custody				
8. Sample Condition	Intact/Broken*/Leaking				
9. Does information on custody records, traffic reports, and sample tags agree?	Yes/No*				
10. Date Received at Lab	_____				
11. Time Received	_____				
Sample Transfer					
Fraction	Fraction				
Area #	Area #				
By	By				
On	On				

* Contact SMO and attach record of resolution.

Reviewed By	Logbook No.
Date	Logbook Page No.

FULL INORGANICS COMPLETE SDG FILE (CSF) INVENTORY SHEET

LABORATORY NAME _____
CITY/STATE _____

CASE NO. _____ SDG NO. _____
SDG NOS. TO FOLLOW _____ _____ _____
SAS NO. _____

CONTRACT NO. _____
SOW NO. _____

All documents delivered in the Complete SDG File must be original documents where possible. (Reference Exhibit B, Section II F and Section III U.)

		Page Nos.		(Please Check:)	
		From	To	Lab	Region
1.	Inventory Sheet (DC-2) (Do not number)			____	____
2.	Cover Page	____	____	____	____
3.	Inorganic Analysis Data Sheet (Form I-IN)	____	____	____	____
4.	Initial & Continuing Calibration Verification (Form IIA-IN)	____	____	____	____
5.	CRDL Standards For AA and ICP (Form IIB-IN)	____	____	____	____
6.	Blanks (Form III-IN)	____	____	____	____
7.	ICP Interference Check Sample (Form IV-IN)	____	____	____	____
8.	Spike Sample Recovery (Form VA-IN)	____	____	____	____
9.	Post Digest Spike Sample Recovery (Form VB-IN)	____	____	____	____
10.	Duplicates (Form VI-IN)	____	____	____	____
11.	Laboratory Control Sample (Form VII-IN)	____	____	____	____
12.	Standard Addition Results (Form VIII-IN)	____	____	____	____
13.	ICP Serial Dilutions (Form IX-IN)	____	____	____	____
14.	Instrument Detection Limits (Form X-IN)	____	____	____	____
15.	ICP Interelement Correction Factors (Form XIA-IN)	____	____	____	____
16.	ICP Interelement Correction Factors (Form XIB-IN)	____	____	____	____
17.	ICP Linear Ranges (Form XII-IN)	____	____	____	____
18.	Preparation Log (Form XIII-IN)	____	____	____	____
19.	Analysis Run Log (Form XIV-IN)	____	____	____	____
20.	ICP Raw Data	____	____	____	____
21.	Furnace AA Raw Data	____	____	____	____
22.	Mercury Raw Data	____	____	____	____
23.	Cyanide Raw Data	____	____	____	____
24.	Preparation Logs Raw Data	____	____	____	____
25.	Percent Solids Determination Log	____	____	____	____
26.	Traffic Report	____	____	____	____
27.	EPA Shipping/Receiving Documents	____	____	____	____
	Airbill (No. of Shipments ____)	____	____	____	____
	Chain-of-Custody Records	____	____	____	____
	Sample Tags	____	____	____	____
	Sample Log-in Sheet (Lab & DCI)	____	____	____	____

		Page Nos.		(Please Check:)	
		From	To	Lab	Region
	SDG Cover Sheet	____	____	____	____
28.	Misc. Shipping/Receiving Records (list all individual records)				
	Telephone Logs	____	____	____	____
	_____				
	_____	____	____	____	____
29.	Internal Lab Sample Transfer Records & Tracking Sheets (describe or list)	____	____	____	____
	_____	____	____	____	____
	_____	____	____	____	____
30.	Internal Original Sample Prep & Analysis Records (describe or list)				
	Prep Records _____	____	____	____	____
	Analysis Records _____	____	____	____	____
	Description _____	____	____	____	____
31.	Other Records (describe or list)				
	Telephone Communications Log	____	____	____	____
	_____	____	____	____	____
	_____	____	____	____	____

32. Comments:

_____

_____

Completed by (CLP Lab):

_____	_____	_____
(Signature)	(Print Name & Title)	(Date)

Audited by (EPA):

_____	_____	_____
(Signature)	(Print Name & Title)	(Date)

EXHIBIT C

INORGANIC TARGET ANALYTE LIST

INORGANIC TARGET ANALYTE LIST (TAL) - TABLE 1

Analyte	Contract Required Detection Limit[1,2] (ug/L)
Aluminum	200
Antimony	60
Arsenic	10
Barium	200
Beryllium	5
Cadmium	5
Calcium	5000
Chromium	10
Cobalt	50
Copper	25
Iron	100
Lead	3
Magnesium	5000
Manganese	15
Mercury	0.2
Nickel	40
Potassium	5000
Selenium	5
Silver	10
Sodium	5000
Thallium	10
Vanadium	50
Zinc	20
Cyanide	10

(1) Subject to the restrictions specified in Exhibits D and E, any analytical method specified in ILM04.0, Exhibit D may be utilized as long as the documented instrument or method detection limits meet the Contract Required Detection Limit (CRDL) requirements. Higher detection limits may only be used in the following circumstance:

If the sample concentration exceeds five times the detection limit of the instrument or method in use, the value may be reported even though the instrument or method detection limit may not equal the Contract Required Detection Limit. This is illustrated in the example below:

For lead: Method in use = ICP
Instrument Detection Limit (IDL) = 40
Sample concentration = 220
Contract Required Detection Limit (CRDL) = 3

The value of 220 may be reported even though the instrument detection limit is greater than CRDL. The instrument or method detection limit must be documented as described in Exhibits B and E.

(2) The CRDLs are the minimum levels of detection acceptable under the contract Statement of Work.